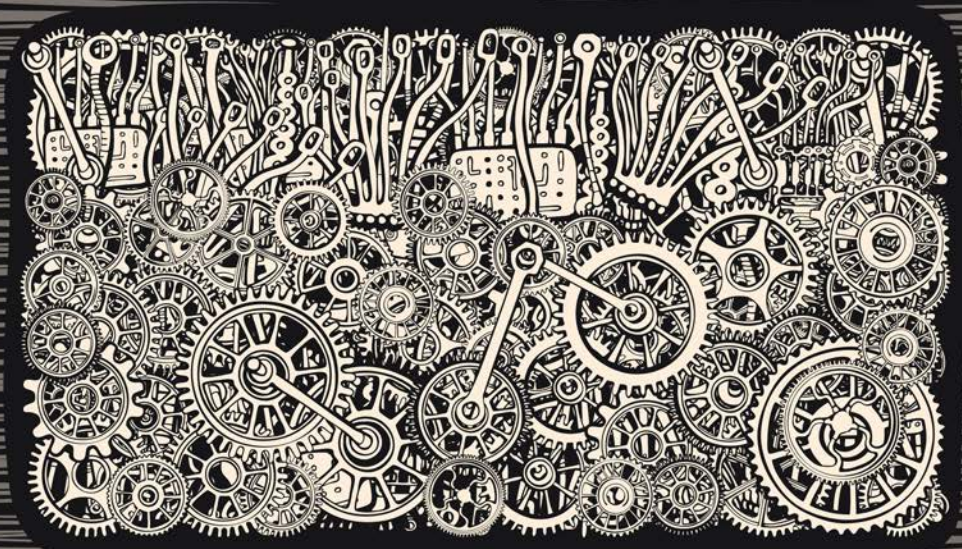
ROUTLEDGE

PHILOSOPHY OF MEDIA

ROBERT HASSAN AND THOMAS SUTHERLAND



Philosophy of Media

Since the late 1980s the rise of the internet and the emergence of the networked society have led to a rapid and profound transformation of everyday life. Underpinning this revolution is the computer – a media technology that is capable of transforming not only itself, but almost every other machine and media process that humans have used throughout history.

In *Philosophy of Media*, Hassan and Sutherland explore the philosophical and technological trajectory of media from Classical Greece until today, casting a new and revealing light upon the global media condition. Key topics include:

- the mediation of politics
- the question of objectivity
- automata and the metaphor of the machine
- analogue and digital
- technological determinism.

Laid out in a clear and engaging format, *Philosophy of Media* provides an accessible and comprehensive exploration of the origins of the network society. It is essential reading for students of philosophy, media theory, politics, history and communication studies.

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Philosophy of Media

A Short History of Ideas and Innovations from Socrates to Social Media

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Introduction

In medias res

To imagine that the plural noun 'media' – often with the prefix 'new' attached – refers to the internet would be an unremarkable commonplace today. This would be especially the case for those for whom a pre-internet time is a time not remembered nor possibly even lived. However, for those of an earlier vintage, the Baby Boomers and those who came before, those who remember the dominance of newspapers and television and radio, and who have had the slightly disparaging term 'old media' foisted onto them as the form that constituted their life-world in that faraway pre-1990s era, the term 'media' still has a fairly modern and solidly twentieth-century ring to it. Such media are still around of course, and are sometimes thriving, notwithstanding their incipient obsolescence.

In what seems to have been no time at all, the 'new' of 'new media' has itself become antique. Media has become singular, a term to describe a practice that encompasses much of life. Media is the network. Media is digital. Media is ubiquitous and cheap and fast. Media is political. Media is also cultural and economic. Media is social. And social media platforms such as Facebook and the networked devices that give access to these platforms become the now-centred media forms that constitute the life-worlds of billions of people across the planet. Media is now. But like the process of social revolution, to live mediation, to be in the middle of it and to be part of it, is often to not realize that one is partaking in radical social upheaval and technological transformation. Ordinarily it is difficult and impractical to stand back and reflect upon processes that we live and breathe. To gain a measure of critical distance when almost every nook and cranny of life is digitally mediated is harder again. We used to get by – could catch up with ourselves – because historiography would intervene *post-facto* and rescue the processes of revolutionary change from the thickening shadows of time and give them narrative life (and often

theoretical and philosophical life) and a place in posterity for us to reflect upon and learn lessons from.

Nonetheless the histories of media and of mediation – the tales of their fundamentally *technological* revolutions – have never been salient in history in general or philosophy in particular. Today they are more obscure than ever. Technological revolutions in media, those really transformative breakthroughs that seldom come along in the history of our species, don't physically disappear like, say, Johannes Gutenberg or Alan Turing, but fan out and evolve as normalized material things to shape economy, culture and society in ways we feel but cannot 'see' and make the connections. It is the 'up close' effects of media that blur the message of the medium itself, to paraphrase Marshall McLuhan.

The problem seems to be that each technological breakthrough in media secures for itself its own hegemony over the individual and over the social world and thereby becomes, in a very real way, hidden from view. The actual contrivance, be it the codex, the printing machine, the telegraph, the computer, soon becomes almost a part of nature. It becomes sedimentary material and forms another layer of the fossil record of media, one that we may use still every day, but whose provenance and significance are obscure to all but the specialist. This process of sedimentation has been occurring since the very beginning of media forms, since at least the development of phonetic writing in Greece around the fifth century BCE. Walter Ong realized this and in *Orality and Literacy* reminded us that writing itself became invisible as technology once its use became normalized. He wrote that writing 'tends to arrogate to itself supreme power by taking itself as normative for human expression and thought' (1982: 293). In becoming 'normative' writing (and reading) thus became 'natural' and therefore not overtly technological, not a humanly constructed media form. Rather it became that special media technology that is situated at the liminal space between consciousness and the world; a space where writing expresses thought and thought in its turn expresses the technology of writing. It is with the invention of writing that our consciousness of history first emerges. And it emerged, as Vilém Flusser (2002: 63) put it:

> not for the banal reason often advanced that written texts permit us to reconstruct the past, but for the more pertinent reason that the world is not perceived as a process, 'historically,' unless one signifies it by successive symbols, by writing.

Every subsequent media invention has been another layer upon this originary media form.

Today the archaeological layers of media that lie nearer the surface, such as the industrially produced mass media forms of the nineteenth and twentieth centuries, already begin to haze and become less relevant to the Baby Boomers who lived with it and through it up to the pre-internet age. They are seen as archaic and extraneous and hopelessly inefficient for those generations born into digitality. Collectively we are losing the memory of mass media's various uses and the understandings of mass media's social effects as digital logic and networks become 'normative for human expression and thought'. Accepting digital media unreflectively on its own terms, as we tend now to do, serves only to elide media history. It also obscures the modern purpose of the essentially capitalist technology of the mass media form out of which, through its appropriation of the written word, the internet and the networked society have emerged.

Going through the 1950s fossil record of media thought, we find that Raymond Williams, for example, saw the social power of media and technological mediation when its logics are captured by capital and then hitched to specific purposes – in this case in high industrial society around the turn of the twentieth century when mass media industries were beginning to organize themselves seriously. Mass media, Williams argued, was a form of *ideology transmission*. Mass media introduced from the outside, he argued, could change society's conception of itself in ways that were not necessarily advantageous to the 'mass' of people. He writes that:

> The conception of persons as masses springs, not from an inability to know them, but from the interpretation of them according to a formula. Here the question of the intention of the transmission makes its decisive return. Our formula can be that of a rational being speaking our language. It can be that of the interested being sharing our common experience. Or—and it is here that 'masses' will operate—it can be that of the mob: gullible, fickle, herdlike, low in taste and habit. The formula, in fact, will proceed from our intention. If our purpose is art, education, the giving of information or opinion, our interpretation will be in terms of the rational and interested being. If, on the other hand, our purpose is manipulation—the persuasion of a large number of people to act, feel, think, know, in certain ways—the convenient formula will be that of the masses.
>
> (1958: 322)

For a generation of thinkers from the 1950s and 1960s who grew up in the traditions of critical theory, what Williams spoke to was a reasoned theory of capitalist media that revealed it as inherently manipulable and irreducibly ideological.

By the 1970s the economic and technological shifts that precipitated the age of globalization and the information technology revolution began to obscure such insights. An element of this shift was the political failures encapsulated in the *événements* of 1968 in France. These gave rise to new thinking about politics and about media within a growing post-structuralist framework that generated new culture-identity and individualistic waves that rippled out across much of the West. An effect of this was that the incipient media theory of Williams and others became detached from a living tradition of critical thinking around ideas of what media is and what mediation does.

The concept of ideology in particular, the very basis of political communication, was buried, and its grave danced on. Media theorist John Corner assumed responsibility for its obituary in his summary of the travails of the concept of ideology during the 1980s and 1990s. He concluded that media theorists should not seek to 'repair' it for a new media age because the concept 'suggested a theoretically precise grasp of mediation processes that was simply not present' (2001: 532). Why this apparent lack *in itself* should qualify the concept for obsolescence instead of subjecting it to ongoing revision and auto-critique as a theory is not revealed. What is revealed, though, is a lack of political and also philosophical aspiration on the part of media theory then and today. Judith Butler saw the problem coming in the 1990s and put it down to the '[…] reduction of Marxism to cultural studies' (1998: 33), the very discipline that Williams helped to found in the 1950s. Through the influence of poststructuralism, our understanding of media as forms of capitalist mediation began to wane, and media studies, coming out of de-Marxified cultural studies, did not seek to bring critical theory along with it, and, just as importantly – did not seek to draw upon *philosophical resources* to forge a philosophy of media sufficient to incorporate the full arc of media history. Older generations forgot about it and younger ones simply weren't exposed to it.

Another important vestige of media history that lies in deep layers of soil is that of print media – the technology that spurred the European Renaissance and produced the wider print culture that emerged from it. The coming of machine-produced words coincided with (and promoted) wider revolutions in science and technology. But we need to

see (or to remember) that Gutenberg's invention was much more than a process to make communication cheaper, more widespread and, potentially, more democratic. It certainly was all these and this is important, but as Williams argues – and this idea has fossilized also – we can't go on thinking of 'communication as transmission alone', as somehow neutral and somehow not profoundly social and reflective of the socio-technical context, especially its political economy, at any particular time in history. As a Marxist, Williams's work follows the logic of dialectical materialism, especially when it comes to the development and application of technology. In Volume 1 of *Capital*, Marx himself was explicit about what technology is and what technology does:

> Technology discloses man's mode of dealing with Nature, the process of production by which he sustains his life, and thereby also lays bare the mode of formation of his social relations, and of the mental conceptions that flow from them.
>
> (1976: 406)

In Gutenberg's time, the 'social relations' that were being formed by increased literacy and the spread of whole new spheres of scientific and technological knowledge were, in the early fifteenth century, a proto-capitalism. Indeed, Gutenberg's original machine was in part a business enterprise with the printing of indulgences providing a handy stream of income for its inventor. Print rapidly became the media that transformed the world and brought forth modernity. As printing industrialized, the print culture that it engendered in the early modern West developed hand in glove with what Benedict Anderson saw to be a 'print-capitalism' – a new media power that carried a new ideology that 'made it possible for rapidly growing numbers of people to think about themselves, and relate themselves to others, in profoundly new ways' (1980: 52). The power of this media, as Anderson goes on to show, was so strong that it was able to insert into the ancient and organic linguistic and cultural communities of Europe a fissiparous 'national consciousness' that formed part of the basis of a not unproblematic European modernity. Not least did this form a generalized 'mental conception' of the world that fitted easily with capitalist conceptions of competition, of markets, of envied territories and economic rivalries. And this thoroughly capitalist conception made normative the need for industrialization without limit or end and for the 'constant revolutionizing' of its technological forms, including its media forms, that Marx and Engels saw as approaching its zenith in 1848.

We indicated that networked media 'are now', suggesting that their speed and ubiquity subsume us in a kind of constant present, blocking access to the subjective experience of time as being duration that stretches from the past and on into the future. In respect of its technological dimensions, this is not a new concept, of course. For example, considering the idea of 'autonomous technology' that we will take up in some detail in this book, Jacques Ellul, in his 1964 book *The Technological Society*, observed that 'the technique of the present has no common measure with that of the past' (p. xxv), meaning it is now centred and finds its legitimacy in the present, and individuals tend to define themselves in relation to it. Ellul wrote these words when the digital network of globe-spanning computers was only a gleam in the eye of someone like computer theorist Vannevar Bush (1945). The point being that making the historical and conceptual links between media technology revolutions has never been more fraught when consciousness and cognition correspond to the digital sphere's logic of immediacy.

However, there is another challenge for us to face, another layer of sediment that needs to be scraped away. We need get to the deepest substratum of our collective media history, to the locus of the formation of the powerful components of thinking that would make it a good bet that our *world would in time be a world of machines and a world that would also become digital*. Some may argue that, at such a depth, the time is too remote and the logical connections between the earliest media and today's are too tenuous. Yet the traces of effect from a distant age are alive and present today in, for example, digital representation of the printed words that we read and write; in the physical logic of keypads; in the 'naturalness' of the requisite hand–eye coordination of our touchscreens; and in the applications and platforms of networked media more generally.

The key point is that these commonplace interfaces with present-day media forms are also interfaces with the ancient world of Greek philosophy where we feel the still-reverberating influence. It is present in the origins and centrality of numbers (the 'sorcery of numbers' as John Gray (2015) phrases it) as a way of making reality comprehensible and quantifiable; it is present in the origins and theorization of mathematics and its foundational connections with writing as its primary mode of expression; it is present in the origins of democracy and its dependency upon both numbers and writing for its functioning; and it is present in the origins, through Plato, of a theory of media where

the ways in which technology can both extend and restrict a person's understanding of the world – and in turn come to determine their behaviour – were first raised in ancient Greece. And through the teachings of Plato humans were able to lay down the philosophical and practical basis upon which they could employ reason. And reason, alongside one of its modes of practice, rationality, was animated by the syntheses of Greek thought in all of the above ideas – and across all the epochs of antiquity from the Classical, through to the pre-Socratic and the Hellenistic.

The uncovering of the *persistence of this ancient logic* as it relates to media, mediation and the computer in our own time constitutes the prime purpose of this book. Despite the archaeology metaphors, this is not an exercise in what is now being referred to as 'media archaeology' (e.g. Zielinski 2006; Huhtamo & Parikka 2011), which, building upon the work of Jacques Perriault, traces the historical connections in media technologies between what Perriault termed their 'use function' and 'social representation' (Huhtamo & Parikka 2011: 3). This emergent strand of media theory is useful – and it does what Ellul urges us to do: to establish technological linkages back through our past. We do develop some of these connections here, but this is not our fundamental concern. The book is partly an exercise in media archaeology, but not in the sense that we seek only to connect seemingly discrete technologies. What we do is to mark out the travel of a specific set of deeply interconnected logics that began with the Greeks and have ended up today working through the 'campuses' of Google Inc., Facebook, or Apple Inc., and through the databases of any number of security agencies around the world. These logics are being functionalized and enacted in the daily lives of billions and are encapsulated, mediated and expressed through the relationship with computing. These interconnected logics we make explicit, and their arc of travel from antiquity to postmodernity, we make clear.

Stemming from Pythagoras, who raised the importance of number and mathematics to the level, almost, of the supernatural as the means for uncovering the absolute reality of the world, a particular logic finds its all-powerful expression today in computing. And as Neil Postman phrased it, 'the sovereignty of numbers' dominates almost to the point of totality (2005: 23). And the capacity for reason, which the Greeks thought would become the means through which we could override wild and uncontrollable passions, was imagined by the early Victorians as a mode of thinking that could be 'industrialized' through automation,

and *improved* through the potential of truth-telling numbers working their logic by means of mechanical computing. Today networked digital computing has indeed begun to automate reason through the advances in computer-based automaticity, which has spread largely unnoticed throughout much of the world, and with potentially catastrophic consequences for our own subjectivity and the limited but human-centred capacity for reason we still possess.

These are important, though quite well established trajectories that we nonetheless take care to re-emphasize, illustrate and extend in this book. However, we complement these – and underscore their importance as media categories – through the introduction of two theoretical innovations that the emergence of the digital has made possible.

The first is the *human relationship to time* through the arc of media technology development from ancient Greece to postmodern globalization. In his *Physics Book IV* Aristotle emphasized the inseparability of space and time when he argued that our understanding of time depends upon measurement and the all-revealing power of number. As he observes: 'time defines the change, being its number, and the change the time' (this may be read more simply as time being the number or measure of movement) (1993: 220b). In this he prefigures Newtonian clock time, the basis for modern industry. However, Aristotle suggests something more than that. If it is argued, as we do, that time and space are socially created, and experienced subjectively, then time, chiefly in modern history through the clock, becomes understood through number and as a *property* of the technology in that it represents the movement of time for us. The clock kept its unvarying rhythm throughout the period of modernity and industrial capitalism. Indeed, its disciplining power enabled these world-changing processes to occur or 'unfold' in the ways that they did. In our networked era of computing and fast-paced globalization, the clock is being eclipsed by a new technology of time, a 'network time' that ushers into our lives – through the mediation of the internet especially – a new form of time discipline. As we shall see, while this time discipline is not rigid and predictable like the clock, it nonetheless serves the same purpose of social domination and the subjugation of human subjectivity.

The second makes salient a new and historically unprecedented challenge to human ontology coming from the growing ubiquity of digital processes, not just in the media sphere, but across all aspects of life that the computer colonizes. Digital computing has transformed many

things, but it also affords the opportunity to think about how it affects us in a very particular way. Until recently it did not make much sense to think too deeply about the idea that we are *analogue creatures*. It was never a pressing philosophical or sociological issue because digital forms and digital logic (in the shape of computing) hardly existed. Now it does. We show that to think of ourselves as analogue gives unprecedented insight into our digital context and allows us to see both its positive and negatives aspects. So how might we consider ourselves as 'analogue'? Freeman Dyson (2001: n.p.n.) states that 'We don't yet know the answer to this question.' But he takes the perspective of the mathematician, and a humanist one at that, who seeks to find a kind of symbiosis or equilibrium between the two states, analogue and digital, much like computer theorist J. C. R. Licklider advocated in the early 1960s (Licklider 1960). A natural symbiosis is the assumption that theorists such as Dyson and Licklider have asked us to work from in the few incursions there have been into the question. We argue in this book that the analogue and digital are *antithetical states* in the human context, and in the age of digital ubiquity this poses serious problems.

To provide some kind of answer to a question that is hardly being posed, we need to be both simple and radical. The 'analogue' term itself today falls into disuse as the logic of the digital pushes it aside. And so to begin our quest we must rescue it from its residual boutique meanings in music, for example, where people of a certain age laud the richness of the vinyl LP in contrast to the purported sterility of the digital CD. However, to view the term as it derives from its Greek root, *analogos*, meaning a person or thing corresponding to or equivalent to nature, is to place the human in the frame in a much less binary and more organic way. We are analogous to nature because we are part of nature. Importantly, in our historical tool use, the tools we developed reflected this. They came from nature and our immediate environment – tools of wood or stone or, later, from metal compounds that came from the ground. Their use reflected an equivalent relationship with the tool and with nature and we could see the result of the technology use in the environment we transformed around us. As we became more complex toolmakers and users, the analogue shifted to more complex, but still clearly analogous, forms. For instance the headlight of a car is a technology that has its analogue in the sun in that both illuminate, and the nuclear submarine, no matter how complex and powerful, finds its analogue in the fishes of the sea.

We easily recognize that the headlights of a car or the submarine are technological forms that find equivalency in nature. Not so the digital computer. Its workings are invisible and its origins from deep within the abstractions of binary logic mean it has no equivalence or correspondence in nature. Computers, as we shall see, draw us into their domains of operation. And taken as a *networked* logic, computing strives towards the goal of *automaticity*. However, in this foundational objective of automation, computing logic simultaneously seeks to eliminate, erode or deplete the human factor with every new innovation and every new application. Social media for example, draw people together virtually while they often drive them apart physically (Turkle 2011). Computers and automation (think 'high frequency trading' in Wall Street) function at speeds that we are unable to register, and with effects that we can hardly anticipate much less exert meaningful control over. Digital logic is thus 'unnatural' in the most literal sense in that its logic moves us towards a virtual world that has no analogue in the complex ecologies of organisms that comprise life on Earth – and of which humans are a component part.

The concept of 'ecology' is useful here. It was coined by Ernst Haeckel in the latter part of the nineteenth century and was derived from the Greek word for 'house' to describe a contained and dynamic system of organisms. This was taken to a new level of theorization in the 1960s with James Lovelock's Gaia hypothesis (2000), which argues the Earth to be a self-regulating and interacting organic totality. In the Lovelockian sense, an ecology has what is known as 'no-analogue'. The term is used to describe unique climate conditions or biological communities that are without current equivalents, something that exists nowhere else in nature. As Williams and Jackson write: 'No-analogue communities (communities that are compositionally unlike any found today) occurred frequently in the past and will develop in the greenhouse world of the future' (2007: 475). Digital computing, we argue, in its creation of a virtual world in which humans and the ecology are implicated, but in a context of non-equivalence, is a no-analogue phenomenon, one that has no precedent in nature or in human tool and technological development. By contrast, writing, that previous world-transforming technology that computing directly emerges from, was predominately analogue. The early pictograms that formed the basis of cuneiform writing, for example, came entirely from nature. In terms of writing's materiality, waxes, reeds, inks and so on, all were drawn

from its users' immediate environment, as were what pictograms and cuneiform represented: people and nature.

By shaping *Philosophy of Media* through this arc of technological development, it becomes possible to view human communication through computing in a different way. Problems of media and their effects in politics, culture and economy take on new and often worrying dimensions. As we noted, to describe and make salient the logic of technological mediation is the main aim of the book. But the implications that flow from this logic also put current ideas concerning our era of postmodernity into a new frame. The book therefore also suggests new understandings, new directions of research and fresh appreciations of what mediation is and does in our networked society. Importantly, it brings to the fore a framework for understanding what a wholly new and rapidly dominant class of what we might term a *post-techne* – that of the digital – means for humans who now must urgently begin to think of themselves as analogue – analogue creatures who, being far too clever for their own good, have sprung the trap that they themselves laid.

The structure of the book is simple. It divides into two parts, with each reflecting the expertise of its authors. The conventional artifice in co-authored books, whereby a single voice is written through it, strikes us as somewhat odd. This is particularly relevant here, when two quite different areas are drawn upon: philosophy and media. We therefore elected to each think and write for ourselves, but towards a common purpose and with a joint feeling of enthusiasm for a shared project. In Part I Thomas Sutherland excavates the deeper levels of the archaeological endeavour. In the West the Greek philosophical heritage is immense. But here it is revealed to be even more far-reaching than we perhaps knew – and more animated than we realized in our networked postmodernity. This did not require, however, a reassessment of the whole of Western philosophy. It is more a different angle of perception in order to recognize connections that may not have been so obvious before. And so each chapter is written in an accessible way that makes clear the connecting philosophical-technological-media steps that brought the pre-modern West to modes of thinking and practice that would make modern science the kind of science it would become. And the same logic would, projecting it forward, render the age-old (and analogue) 'propensity to truck, barter and exchange one thing for another', as Adam Smith wrote in *Wealth of Nations* in 1776 (2003), to become expressive of a postmodern world where

information (expressed as number and writing) is the fundamental 'thing' that we now value in capitalist exchange. In Part II Robert Hassan takes up the story from the perspective of postmodernity proper, and interprets the world from the insight of 'being analogue' in an increasingly digital world. It shows that we have brought a great deal of baggage with us from the age of modernity and from its correlates in the Enlightenment's epistemology. One troubling feature of our postmodernity is that the burdens we carry, such as those of 'progress' and of political democracy, seem to travel not so well with us today, notwithstanding the fact that we are unable either to discard them or to replace them with something more suited to these new times. How are we to deal with such postmodern contradictions as individuals and as members of a now global and networked society?

Philosophy of Media is merely the opening of a conversation. But it is a conversation that we need to have if we are to live lives that are less fraught and uncertain. It is imperative that we understand the provenance and character of our media world. The questions we pose are necessarily introductory ones that allow us to feel our way and to form the basis for the more difficult questions that must follow. To not think critically about the nature of our media world and how it came to be digital is to leave ourselves open to a growing unawareness, a kind of digitally induced dementia, where we become progressively ill-equipped to even formulate the kind of questions we need to get to the core of our twenty-first century malaise.

Part I

PROBLEMS AND DEBATES IN MEDIA FROM ANTIQUITY TO MODERNITY

1 The disruptive power of the written word

One of the reasons that it is important to study media is to gauge the effects that various technologies can have upon our everyday lives. A critical theory of media should identify the advantages and utilities that a particular medium offers us, while avoiding the temptation to simply affirm said medium without proper consideration of the ways that it might be harmful to us as individuals or to society as a whole. The possibility of exercising agency within an increasingly dense media environment is reliant upon our capacity to evade the anaesthetic properties of media that would render us docile and subservient in the face of their determinative power. Simultaneously though, it is important to recognize that anxieties over the role of new media in education and knowledge are not at all new – we can find them at least as far back as ancient Greece, the birthplace of the Western philosophical tradition. Although various forms of writing (from the pictographs of the Sumerian cuneiform through to early alphabets) have existed for many millennia, it was in Greece around the fifth century BCE that an especially pivotal medium – phonetic writing – really came into its own, beginning to demonstrate a decisive social and cultural impact, and it is at this historical juncture that we will begin our exploration into the intertwined discourses of philosophy and media.

What the early philosophers were dealing with at this time was not a plethora of media forms like we have today; rather, communication was still monopolized by the spoken word. Consequently, the popularization of literacy (i.e. reading and writing) was profound and dramatic in its effects, and the legacy of this transformation can still be seen in the philosophical tradition today. To speak of this tradition, obviously, is to speak of a genealogy that is profoundly Eurocentric – excluding the various non-Western lineages of thought that have developed over the past few millennia, and often occluding its inherent limitations and blindspots that would bring into question its pretensions to

universality – and we therefore acknowledge that our discussion of the intersections between media and philosophy evince a decidedly confined viewpoint, one that cannot be straightforwardly extrapolated out to a global scale. At the same time, though, we believe that the dissymmetrical processes of globalization that we witness today, and their connection to the logic of digital computation and high-speed networking, are tied to this philosophical tradition in a manner that demands analysis. Before we arrive at this point, however, we must reflect upon the origins of this very tradition, on which the trajectory of Western thought and culture are inextricably grounded.

The 'pre-Socratic' school of philosophy

Thales (*c.* 624–546 BCE) is generally regarded as the first Greek philosopher and thus represents the formative point of the Western philosophical tradition as a whole. It is with Thales that philosophy, as we typically think of it, begins. Although Greek philosophy tends to be associated with the city-state of Athens – an intellectual and cultural hub of the ancient world – Thales was actually born and lived primarily in Miletus, a Greek city on the coast of Asia Minor (modern day Turkey). According to legend, he was the first to bring geometry from Egypt to the Greeks and is often regarded, albeit on the basis of purely circumstantial (and quite likely spurious) evidence, as the first true mathematician. While historical accounts are rather sketchy, it seems that Thales viewed water as the originary material out of which all things come to be. The difficulty for studying Thales' thought, however – and the reason that we have little ability to state with any great certainty what his ideas actually were – is that he never wrote any of it down. Living at a time when knowledge was transmitted almost entirely through the spoken word, he presumably felt little need to store and disseminate his philosophy in such a fashion. It isn't that the medium of writing didn't exist during his lifetime, but merely that it had little significance for education and enquiry in the way that it does today. Greek students learnt through the memorization and recitation of orally transmitted poems, rather than consulting written texts – the problem for us being that, as Harold Innis, one of the first scholars to directly engage with the relationship between media and the history of philosophy, notes, 'we have no history of conversation or of the oral tradition except as they are revealed darkly through the written or the printed word' (2008: 9), resulting in a certain distortion and bias

towards these latter forms of communication within historical research. Writing, overwhelmingly, is the medium through which history itself is accessed – it constitutes the dominant medium of history.

We may presume, however, that such circumstances were rapidly changing, for Anaximander (one of Thales' students) did actually write his thoughts down, and while we quite possibly have only one authentic quote preserved from this work, it nonetheless marks a crucial step both in the development of philosophy as we typically understand it and in its historical preservation. Anaximander's use of prose 'reflected a revolutionary break, an appeal to rational authority, and the influence of the logic of writing' (Innis 2007: 67). Anaximander rejects the organic metaphor of water deployed by Thales, and instead proposes the abstract concept of the *apeiron* – an eternal and boundless entity – as the originary substance of the cosmos, identifying a principle of existence unattainable through sensible intuition (and thus reachable only through the pure exercise of the intellect). Anaximenes (who was in turn a disciple of Anaximander), however, reverts back to the more accessible materialism of Thales, asserting that air is the primary substance out of which the world was composed. These three thinkers compose what is commonly referred to as the 'Milesian school', which is in turn part of the 'Ionian school', including other philosophers such as Heraclitus, Archelaus and Diogenes of Apollonia. What binds all of these philosophers is a shared interest in what we now know as 'metaphysics' (a term that only emerged in mediaeval scholarship) – they seek to explain what the world is made of and the basic laws of the universe. Many of them also dabble in cosmology – the study of how this universe came to be. Most notably for the time when they were working, the Ionian school sought to avoid supernatural explanations for the phenomena that they observed. Rather than explaining environmental effects away as the workings of the gods (as their peers did), they look to explanations that came from around them, contained within the nature of matter itself – air, water, fire and so on.

By contrast, Plato, who lived about a century after the Ionian school first flourished, has little interest in these forces of nature. This is not to say that he is not concerned with metaphysical argumentation, but that his focus is both a lot broader and a lot more oriented towards the concerns of human beings – a likely result of his teacher Socrates' (*c.* 469–399 BCE) influence. Socrates was not the first philosopher; within the Mediterranean basin alone, he was preceded by a number of important, if oft-forgotten thinkers (some of whom we have just

mentioned), not to mention the numerous figures within Babylonian, Persian, Indian and Chinese philosophy. Nevertheless, Socrates is arguably *the* key building block in the formation of Western philosophy as a distinct field of enquiry and is virtually unmatched in his influence upon subsequent thought. When we speak of 'Western philosophy' as a singular discipline, we are inevitably speaking of a tradition that is grounded in the influence of this one remarkable figure.

Socrates lived in Athens, at a time when the once-great city was finding its empire crumbling under repeated attacks by the southern city-state of Sparta. Although he had once served in the Athenian army, in his later life he forsook conventional employment for a modest life of philosophical discussion and teaching. Unwilling to mindlessly follow the social or political conventions of the time in which he lived, Socrates eventually found himself on trial for two charges (impiety and corrupting the youth) and was eventually put to death. The problem with discussing Socrates, though, is that, like Thales, he left no written works of his own. Writing was still in its relative infancy at the time when he lived – the Greeks had developed the first true alphabet (before then, alphabets had included consonants but not vowels, making it far more difficult to fully record the sound of words) less than 300 years prior to his birth – and he was sceptical of its usefulness in the teaching of philosophy. He preferred instead to utilize the method of *dialectics* – he would debate other individuals, gradually eliminating contradictory hypotheses until something close to an unambiguous definition was found.

As a result, like all historical figures, when we speak of Socrates we do not so much speak of a person as we do a representation within others' writings, in particular two of his followers, Xenophon and Plato. What distinguishes Socrates from most other famous figures throughout history, however, is that Plato did not simply record the sayings and philosophies of Socrates, but rather utilized Socrates as a character within his own dialogues in order to propound his own, complex philosophical theories – hence Pierre Hadot's (1995: 148) argument that:

> Socrates pulled off his enterprise of dissimulation so well that he succeeded in definitively masking himself from history. He wrote nothing, engaging only in dialogue. All the testimonies we possess about him hide him from us more than they reveal him, precisely because Socrates has always been used as a mask by those who have spoken about him.

Socrates is, in himself, a *simulacrum*: a literary character in lieu of the historical figure that it represents, a copy for whom the original has been lost.

Socrates was, from what we know, an outwardly humble thinker, who chose to forgo both the overblown metaphysical speculation of his philosophical predecessors, generally referred to as the 'pre-Socratics', and the flashy, rhetorical gesturing of his sophist contemporaries (whom he despised). Socrates did not commit to complex theories; he did not seek to explain the nature of being, the possibility of knowledge or how the world was created, but instead focused upon more simple, worldly matters – as Plato (1997: 27) famously records, Socrates was, more than anything else, critical of the belief that 'one knows what one does not know'. In short, Socrates was a philosopher of ethics – he sought to discover how one could lead a good life. Yet this image, even as it is recorded in Plato's early writings, differs markedly from that which is provided by Plato's work as a whole. In some sense, it may be said that Socrates' importance within the history of philosophy rests in large part not so much upon his own philosophy, but upon the influence that he passed on to Plato. Fittingly, the British philosopher Alfred North Whitehead (1978: 39) once stated that the 'safest general characterization of the European philosophical tradition is that it consists of a series of footnotes to Plato'. All subsequent philosophical enquiry within the Western tradition can, at least in some fashion, be understood as responding, either positively or negatively, to the problems that Plato puts forward.

Plato was, in contrast to his mentor, not terribly modest in his approach. His writings cover not only ethics, but also logic, physics, metaphysics, cosmology, aesthetics and politics. Through his establishment of the Academy, the first school dedicated to the teaching of philosophy, which would last approximately 300 years before being destroyed by the Romans, he was able to ensure that his legacy and ideas would be passed on to future generations of thinkers. Plato was, in many senses, the archetypal philosopher, a polymath who sought knowledge with an unprecedented (and for the most part unmatched) scope and breadth. Owing to both the range of his subject matter and the time in which he was writing, Plato is crucial for this book's purposes – he was the first of his kind to give ample consideration to the question of media. As Paul Levinson (1997: 18) observes, Plato and his contemporaries 'were among their many other pioneering pursuits the original media theorists', or at the very least, 'the first that we know

about in recorded history'. In fact, throughout the course of his dialogues, Plato establishes many of the questions that are still being asked today in studies of communications and mediation.

Plato's critique of writing

Plato found himself in the midst of a dramatic cultural shift, one that would have inestimable effects upon the development of Western civilization. Roughly three centuries after the Greeks had first invented the fully phonetic alphabet, able to represent all the basic sounds of Greek language within 24 discrete letters, they were gradually learning to take advantage of its ability to store knowledge externally. Rather than having to memorize repetitive formulas, sayings and narratives – as occurred, for example, with the epic poetry of Homer and Hesiod, which 'constituted a body of invisible writing imprinted upon the brain of the community' (Havelock 1963: 141) – as the means of preserving values and traditions across generations, people could now record their thoughts for posterity. This is what Walter Ong (1982) describes as the transition from an 'oral culture' to a 'literate culture'. Whereas Socrates did not partake in writing, choosing to remain within the confines of orality, Plato took full advantage of this burgeoning medium, writing numerous dialogues explicating his philosophical ideas. These dialogues are a wonderfully evocative symbol of the transition from orality to literacy, in that they comprise what are essentially spoken debates, most of which feature Socrates, in written form – almost like plays. This is not to say that these were accurate recordings of historical debates – some may be inspired by real events, but the Platonic dialogue is unambiguously a genre of fiction, albeit one that often features genuine historical figures.

In one of these dialogues, the *Theætetus*, Plato makes an intriguing comparison between the human soul and a wax tablet (the portable, reusable writing surface that was commonly used in his day to quickly record ideas, before eventually transposing the writing to a more permanent storage medium). For Plato, the minds of those people who are skilled at learning are like a tablet that is 'deep and abundant, smooth and worked to the proper consistency', whereas those who have trouble with such matters are like a tablet that 'is "shaggy" and rugged, a stony thing with earth or filth mixed all through it' (1997: 215). Truth, Plato argues, is not something that we just encounter in the world around us – in fact, he actually suggests that such empirical observation is in most cases going to be a detriment to the acquisition of true knowledge.

Instead, he proposes that truth is already written upon the wax tablet of our immortal souls and therefore it becomes the job of the philosopher to attempt to recollect these truths. This metaphor is notable because it seeks to explain a phenomenon, not using the natural, elemental metaphors of the pre-Socratics, but through the example of a human-made technology. Truth, for Plato, is a form of writing, beginning a pattern that persists even in the present day, whereby philosophers discuss the soul and body in terms of media and technics.

Ironically, in another of these dialogues, the *Phædrus*, Plato (1997: 551–2) appears to denounce the effects of writing upon the students of Greece. Recalling a legend regarding a conversation between the Egyptian God Theuth (who gave humanity the gift of writing) and King Thamus, he states:

> Since you are the father of writing, your affection for it has made you describe its effects as the opposite of what they really are. In fact, it will introduce forgetfulness into the soul of those who learn it: they will not practice using their memory because they will put their trust in writing, which is external and depends on signs that belong to others, instead of trying to remember from the inside, completely on their own. You have not discovered a potion for remembering, but for reminding; you provide your students with the appearance of wisdom, not with its reality. Your invention will enable them to hear many things without being properly taught, and they will imagine that they have come to know much while for the most part they will know nothing. And they will be difficult to get along with, since they will merely appear to be wise instead of really being so.

Plato, presumably echoing the arguments of Socrates (given that the latter forswore all usage of this medium in the transmission of his philosophy), suggests that although writing may allow us to record our thoughts, it also harms our memory and our thought processes in general, because it relies upon the translation of our inner thoughts into external symbols. This contention is premised upon an understanding of speech which he explores more clearly in the later dialogue *Sophist* (1997: 287), when he asks, 'aren't thought and speech the same, except that what we call thought is speech that occurs without the voice, inside the soul in conversation with itself?' In effect, Plato assumes that speech is nothing more than an exteriorization of thought, rather than a medium in its own right; it is not a translation of thought into a different form, but 'the stream of sound from the soul that goes through

the mouth' (1997: 288). A similar argument is made by Aristotle (2001: 40) – who studied under Plato at the Academy – when he states that '[s]poken words are the symbols of mental experience and written words are the symbols of spoken words'.

What Plato perceives in writing, by contrast, is a chain of imitations – *phantasms*, to use the original Greek term, or *simulacra*, as is the more common Latin expression – in which the true meaning of thoughts is gradually blurred as they are copied into an abstract, mediated, *representational* form. Writing divorces words from the mind that created them and in doing so it transforms them into mere spectres of a truth that is perfectly inscribed within the soul. Writes Umberto Eco:

> Plato's text is, of course, ironic. Plato was writing his argument about writing. But he is putting it into the mouth of Socrates, who did not write. Therefore Plato was expressing a fear that still survived in his day. Thinking is an internal matter; the real thinker would not allow books to think in his place.
>
> (1994: 64)

'Nominating Plato as a source of communication theory', writes John Durham Peters (1999: 36), 'might seem simply an act of grasping for a noble lineage if the *Phaedrus* were not so astoundingly relevant for understanding the age of mechanical reproduction.' In his critique of writing, Plato proffers quite possibly the first clear articulation of a media theory – the moment in which questions of mediation and the ways in which technology can both extend and restrict a person's understanding of the world, and in turn can come to determine their behaviour – first entered the realm of philosophy. Of course, Plato himself would not have described it as such. The only time the notion of a 'medium' (*métaxy* in the original Greek) appears in Plato's work is in his discussion of the spirits who 'interpret and carry messages from humans to gods and from gods to humans' (1997: 486). Yet even if he does not describe it in this way, Plato's interrogation of the question of mediation is actually much broader and much more consonant with present-day concerns. For Marshall McLuhan (1962: 22), what Plato is reacting to is 'the phonetic alphabet with its abstraction of meaning from sound and the translation of sound into a visual code'. The phonetic alphabet, McLuhan argues, engendered an unprecedented shift in the way that people saw the world. This is because it sought to record speech, not through pictograms that represented specific words or things, but through abstract letters that represented sounds.

As a result of this shift, McLuhan argues, the complexity of the spoken word, with its ability to transmit a person's inner thoughts, was forced into an artificial medium that reduced this complexity into the 24 uniform letters of the Greek alphabet.

At first glance, it seems rather strange that Plato would make such a sharp critique of the medium that he relied upon to promulgate his ideas. Yet it is not just writing that comes in for questioning. Plato's corpus exhibits a consistent anxiety regarding various forms of media and communication that existed in his day, and their associated social and cultural effects upon the city-state. One of the most common themes related to this worry that runs throughout his works is the disparaging of his most famed of adversaries, the sophists and their oratorial techniques. The sophists (e.g. Protagoras, Gorgias, Antiphon, Critias, etc.) were teachers and rhetoricians who flourished around the same time as Socrates and his students. While Socrates, at least according to Plato and Xenophon, did not accept money for his teaching, and generally emphasized that his claim to wisdom hinged upon his lack of genuine knowledge, the sophists were paid, usually by the wealthy families of young noblemen, to instruct them in the sciences of wisdom and virtue. More specifically, they were experts in the communicative medium of rhetoric (the art of persuasion) and claimed to be able to teach these men to be able to convince any audience through the power of speech.

As a part of this approach to education, the sophists also taught philosophical argumentation. Like Socrates, the sophists weren't terribly interested in the physical properties of the world, but instead focused upon questions of law, ethics and the possibility of knowledge. They fell, for the most part, into the philosophical school of scepticism – that is, they set out to demonstrate the impossibility of true knowledge. Gorgias, a notable sophist whose ideas border on solipsism, was the most fervent in these views. Unlike his colleagues, he does not even believe in the possibility of teaching wisdom or virtue, seeing these as only relative values; instead, he considers the ability to persuade others to be the sole science of any worth. Socrates was a virulent critic of the sophists, and this antipathy was evidently influential upon Plato as well. Throughout his dialogues, several of which are set as debates between Socrates and particular sophists, Plato (1997: 243) has few kind words to speak of these fellow teachers, describing sophistry as both 'the kind of wage-earning that actually earns money, though it claims to deal with people for the sake of virtue' and 'the hunting of

rich, prominent young men'. In other words, he views it as exploitative and manipulative, not interested in seeking truth, but simply giving the veneer of wisdom in order to attract wealthy benefactors.

Likewise, in the dialogue *Gorgias* (1997: 804), which involves a (presumably fictional) discussion between its namesake and Socrates, Plato argues that:

> [o]ratory doesn't need to have any knowledge of the state of their subject matters; it only needs to have discovered some device to produce persuasion in order to make itself appear to those who don't have knowledge that it knows more than those who actually do have it.

In short, Plato sees sophism as inferior to the philosophy expounded by his mentor, precisely because it seeks to persuade others, not through dialectical induction, measured reasoning and the search for true knowledge, but instead, through the flashiness of rhetorical technique. Rather than using dialogue and argument as a means for clarifying words and concepts, reducing them to their most precise, limited definition, Plato views the sophists as taking advantage of the indeterminacy of words in order to fool their audiences. With this in mind, we can now understand why Plato might have criticized the medium of writing even while relying upon it himself; the problem with written words, he notes, is that '[y]ou'd think they were speaking as if they had some understanding, but if you question anything that has been said because you want to learn more, it continues to signify just that very same thing forever' (1997: 552).

Writing for Plato has its uses, but it is not 'alive' in the same way as speech – it can't respond to arguments or defend itself from criticism. It just remains static – a poor simulacrum of speech. The problem, therefore, is that writing is likely to end up being used in the same ways that the sophists use spoken rhetoric – it isn't simply that speech is good and writing is bad, but that both have benefits and limitations, writing tending towards the latter. Philosophical writing is, in Plato's view, largely commensurate with sophistry. Rather than providing wisdom, it offers a shortcut for adopting the outward *appearance* of wisdom, by allowing one to memorize already-recorded ideas. He worries that writing is not as effective a form of memory as it might initially seem, for while it does allow one to store data in a relatively permanent manner, this comes at the expense of one's own memory – that is, the more one relies upon external means of storage, the less able one is to remember facts *without* such assistance. At the same

time that he wishes to overthrow the traditional Hellenic curriculum, which was centred upon the memorization and retelling of Homer and Hesiod's epic poetry as a means of instilling cultural norms and social values, Plato worries that the students of ancient Greece, who were previously forced to learn such poetry through entirely oral forms of storytelling, will find themselves increasingly seduced by the false promises of writing and of ideas that have been frozen in time, rather than being tailored to individual audiences and experiences.

It at first appears rather hypocritical that Plato is so critical of writing in the *Phædrus*, given that he himself relies upon writing as a medium to store and transmit his ideas. Yet is this actually so odd within the larger context of media theory? What Plato recognizes in this passage is the most fundamental insight of media studies as a whole: that the introduction of medium can alter the way in which we view, understand and interact with the world and, as such, can in turn have considerable effects upon society as a whole. Ong (1982: 78) notes that 'essentially the same objections commonly urged today against computers were urged by Plato in the *Phaedrus* […] against writing'; as silly as Plato's argument now sounds, his critique of writing, and his understanding of mediation as an inferior mimetic representation, sets the scene for all subsequent understandings of media as an object of study. Ancient Greece, at the time Plato was operating, 'marked the point in human history when deeply interiorized alphabetic literacy first clashed head-on with orality' (Ong 1982: 24), and within this context the *Phædrus* represents a crucial recognition of the disruptive effects that such a transition can manifest.

Given that Plato compares the soul to a wax tablet, it should be fairly obvious that he is not entirely against the practice of writing. He merely wishes to foster a better sort of writing – one that encourages and bolsters dialectical teaching and debate – and to dissuade students from the kind of writing that allows thought to ossify. The unusual form that his writing takes reflects this, the dialogue developed as the 'most effective instrument for preserving the power of the spoken word for the written page' (Innis 2007: 60), capturing the vivifying power of Socrates' arguments in a manner designed to spur on further such discourse. Writes Ieuan Williams (2008: 22):

> [w]hat he clearly understood was that concepts such as meaning, truth, objectivity, accuracy and clarity, which ought to be of central concern in media theory, are essentially normative in nature: they are what legitimate

> and acceptable uses of media aim at; stating what is false, expressing and influencing people through subjective judgements, and creating representations that obscure and distort for the purposes of persuasion, fall short of standards Plato believed to be inherent in the very nature and constitution of media.

It is striking how similar Plato's critique is to many of the anxieties expressed today – and just as he uses writing in order to denounce its influence, there are many people today who take advantage of the media that they have at their disposal in order to articulate their concerns regarding these very same media. Even while being one of the most innovative thinkers across history, Plato remained a deeply conservative cultural critic. He was one of the most effective writers of his age, able to utilize the medium in ways previously unthought, and yet he feared the effect of this new media upon those he perceived as the ignorant, docile masses, as we will examine further in the proceeding chapter.

Logocentrism and the privilege afforded to speech

Plato *does* believe that the practice of philosophy is adequately communicable, but he is also convinced that this is only possible through speech – and more precisely, through the art of dialectic, whittling concepts down to their purest form. He counterposes this dialectical reasoning against the tricky word-games of the sophists, who use the potential ambiguities of spoken language in order to confuse and obfuscate, rather than elucidate. In the words of Eric Havelock (1963: 209), dialectic 'was a weapon for arousing the consciousness from its dream language and stimulating it to think abstractly'. Crucially though, he is only able to make this argument because he views speech as being an inherently *pure* form of communication, flowing directly from the soul. Plato (1997: 319) is, in effect, a technophobe, for in spite of his vast contributions to the art of the written word, he is actually quite suspicious of the way in which technologies might hamper the philosopher's ability to work, declaring that:

> it is not painting or any other sort of manual craft, but speech and discourse, that constitute the more fitting medium for exhibiting all living things, for those who are able to follow; for the rest, it will be through manual crafts.

Plato was not the first philosopher to celebrate speech in such a manner. Heraclitus of Ephesus and Parmenides of Elea, the two pre-Socratic philosophers who had probably the greatest direct influence upon Plato's thought, both discuss truth in terms of speech (see Curd 2011). For Heraclitus, although the world appears to be in a state of constant change and contradiction, there is a structure that underpins it, and this is known as the *logos* – this being the Greek word for a spoken word or utterance (as well as thought, account, narrative, among a variety of other meanings). From the fragments we have available, it isn't totally clear what he is referring to when he speaks of this concept, but it seems to represent the objective order of the universe that Heraclitus alone is able to speak through his philosophy. It is the law that governs all speech acts and yet few can actually hear it. Generally depicted, perhaps not totally unfairly, as something of a misanthrope, Heraclitus believes that the general population walk around as if they were asleep, unable to hear or speak in the terms of the *logos*. Hence it is only those who *love wisdom* (whence the term 'philosopher', meaning 'lover of wisdom') who are able to recognize the way in which it guides their destiny. This distinction between ordinary, everyday speech and the true utterances spoken in accordance with the *logos* also manifests itself in the work of Heraclitus' contemporary Parmenides, who emphasizes the entirely static, eternal nature of truth counterposed against the flux of everyday perception. Completely rejecting any appeal to ordinary experience as a basis for apprehending this truth, he argues that we must abandon the idle gossip and false opinions of the masses and instead judge according to the *logos*.

This implicit valorization of speech (and more specifically, of a certain kind of speech, one that is founded upon and constantly grounded in truth) in both accounts works its way into the philosophy of Plato, but has also found a much more permanent place within the tradition of Western metaphysics. According to the French philosopher Jacques Derrida, Plato exists within a long line of *logocentric* philosophers, who privilege the spoken word over written language, presuming the former to be correspondent to the interiority of thought, and the latter a dead, alienated exteriority. Plato was so convinced of the inferiority of writing as a means of *accurately* communicating philosophical ideas, that he actually kept one of his principal metaphysical teachings – that of the relationship between the Good and the One – almost entirely unwritten. We only have knowledge of it today on account of later philosophers such as Aristotle, Simplicius and Plotinus, who

recorded it. For Derrida (1997: 34), the idea that writing is an inferior transposition of the spoken word relies upon a conception of speech as effectively unmediated and thus able to perfectly transmit a person's mental experience:

> the *Phædrus* denounced writing as the intrusion of an artful technique, a forced entry of a totally original sort, an archetypal violence: eruption of the outside within the inside, breaching into the interiority of the soul, the living self-presence of the soul within the true logos, the help that speech lends to itself.

Derrida views this *logocentrism*, whereby speech and thought are privileged over writing (or any other perceived means of exteriorization) as not just a curiosity exclusive to the ancient Greeks, but as a more general and consistent feature of philosophical discourse. We see it, for instance, in the work of the eighteenth-century Genevan philosopher Jean-Jacques Rousseau, whose political writings had an enormous impact upon the French Revolution, and modern political thought as a whole, and who argues – in one of the more famous philosophical discussions of media – that '[w]riting, which would seem to crystallize language, is precisely what alters it. It changes not the words but the spirit, substituting exactitude for expressiveness. Feelings are expressed in speaking, ideas in writing' (1966: 21).

For Rousseau, writing results, in words remarkably similar to those of Plato in the *Phædrus*, in the alienation of speech; whereas the spoken word is the direct expression of thought, the written word is an abstraction, severing the tie between these two functions. Yet as Derrida (1997: 98) observes, whereas Plato justifies his denunciation of writing through an appeal to the eternal, objective forms that he sees as being lost in the alien marks inscribed upon a wax tablet, Rousseau instead premises his critique upon 'the subject's self-presence within *consciousness* or *feeling*' – that is, Rousseau criticizes writing not because it is necessarily detached from truth, but because it is detached from the *emotional immediacy* of speech.

Derrida sees this logocentrism also in the work of Ferdinand de Saussure, who developed the principles of semiotics that we still commonly use to study media representations today. Saussure (1959: 23–4), who divides language between the concept (the *signified*) and its spoken sign (the *signifier*), claims that 'the object of study in linguistics is not a combination of the written word and the spoken word', for the spoken word 'alone constitutes that object' even though the

writing that represents it may often manage 'to usurp the principal role'. Writing thus remains phonetic, as 'the outside, the exterior representation of language' (Derrida 1997: 31). Even McLuhan (1964: 55), who views television as a means for restoring the kind of tribal interdependence, with its 'seamless web of kinship and interdependence', that only existed in oral cultures prior to the introduction of writing, often falls into this pattern of logocentrism, viewing literacy (especially after the invention of the printing press) as a process of alienation, emphasizing rationality, fragmentation and individualism over intuition, fluidity and interconnectedness. Such an ideological representation seeks, in Derrida's (1988: 20) words, to restore 'a transparency or an immediacy to social relations', and yet it ignores the way in which such a conception of speech is already tied up with a broader history of writing.

The lesson that can perhaps be drawn from Derrida's work is that philosophy tends to be suspicious (or even outrightly fearful) of media technologies, for it views them as in some way threatening the primacy of conceptual thought upon which it relies. The consequence is that philosophers risk obscuring the ways in which media might actually affect or even determine the production of philosophy. As Havelock (1963: 25) notes, '[f]or Plato, reality is rational, scientific and logical, or it is nothing', an attitude in direct opposition to the dominant, *oral* mode of thought in his day, making one wonder whether, in spite of his denunciation of the medium of writing, his work is actually in large part conditioned by this medium. Let us not forget that philosophy is a mode of communication, and from its very beginnings, it was focused upon not only seeking truth, but encouraging others to do likewise. We cannot simply treat the media that provide the means for storing and transmitting these philosophical ideas as secondary to the ideas themselves, for this would mean failing to take into account the way in which the very act of communicating contributes to *producing* the message in the first place. 'Philosophical astonishment', writes Friedrich Kittler (1981: 90), 'has never challenged its own preconditions: the techniques of questioning, the books and the institutions, which are philosophy too' – the way in which philosophy is communicated, in other words, matters. More broadly, we might extrapolate from this to note that learning and teaching are practices that are always tied up with the technologies of the day, and in studying media, we should pay careful attention to the way in which our processes of learning are altered by our media environment and to what ends these technologies serve.

2 The mediation of politics

It is somewhat ironic that Socrates and Plato, as observed in the previous chapter, are so intensely critical of the sophists of their time, for Socrates demonstrates himself to be a skilled and wily orator – one need only read the accounts of his trial (in either Plato's *Apology* or Xenophon's *Memorabilia*) to realize this. Likewise, the undeniable literary value of Plato's dialogues demonstrates his skill with the written and presumably also spoken word. In fact, Diogenes the Cynic (a contemporaneous, albeit much more eccentric philosopher) criticizes Plato for being as disingenuous and manipulative in his use of language as those he criticizes. But this is essential to Plato's brilliance as a philosopher; he uses the tactics of both sophistry and writing in order to undermine them, for he perceives them as deleterious not only to philosophical practices, but also to the proper and just functioning of the city-state. Plato's embryonic media theory outlined in the previous chapter, in other words, is inseparable from his political worldview. Like so many philosophers of his time, the efficacy of philosophy is intertwined with the communicative environment of the *polis* – that is, the city or community through which philosophical ideas and concepts are disseminated.

The Platonic antipathy for democracy

Plato's conception of mediation and communication, and his anxieties regarding writing and sophistry, are both heavily influenced by a general distrust of the masses. In his longest and most famous dialogue, *The Republic* (1997: 1063), which sets out to envision the perfect city-state, this elitism is demonstrated clearly, portraying 'children, women, household slaves, and […] those of the inferior majority who are called free' as largely uneducated, unwise and thus controlled by their irrational passions and desires. In his estimation, this makes such people unworthy of making political decisions. In spite of living in one of the

first democracies in the world, Plato is no democrat, let alone a populist. Athens itself was hardly an inclusive, liberal democracy by modern standards, excluding women, slaves (including those who had been freed) and foreigners from citizenship, and thus from the opportunity to participate in politics, and Plato for the most part follows these conventions. In particular, Athens would appear to have been especially misogynistic even for its time (compared with Sparta, for instance) and this attitude is reflected in Plato's frequently expressed contempt for the intellectual capacities of women.

Plato's conception of philosophy is reflective of the social hierarchies within which it was created. 'The body keeps us busy in a thousand ways because of its need for nurture' complains Plato (1997: 57). In fact, he goes on to argue, the body and its constant distractions 'makes us too busy to practice philosophy'. The proliferation of intellectual thought within the Greek city-states, and later the Roman Empire, was in large part a result of their highly regimented systems of social organization, which offered elites such as Plato the opportunity to live leisurely, free of undue material distractions. At this time, philosophy was a practice of aristocrats and outcasts – those who did not have to suffer the drudgery of the working life and therefore had the time to devote to contemplation and debate. 'Efficiency and productivity were problems for slaves, not philosophers' (Postman 1992: 25).

Key for understanding Plato's conception of philosophy is the question of time. When you 'look at the man who has been knocking about in law courts and such places ever since he was a boy; and compare him with the man brought up in philosophy', he argues (1997: 191), it is like 'comparing the upbringing of a slave with that of a free man'. Why is this? Precisely, Socrates answers, in response to Theætetus' questioning, because the latter always has 'plenty of time'. The upshot of this line of thought is that Plato seeks to exclude from government not only the aforementioned already-disenfranchised groups, but effectively anyone *other than* philosophers; 'until political power and philosophy entirely coincide' he suggests (1997: 1100), 'cities will have no rest from evils'. Democracy is liable to devolve into a tyranny of the poor and uneducated, led by demagogues who use rhetorical techniques in order to appeal to their fears and prejudices.

This perspective on the role of philosophy within the governing of the *polis* is not at all dissimilar to the aforementioned writings of Heraclitus. There is a wonderful irony in the fact that Heraclitus, the first philosopher to deal explicitly and unambiguously with the problematic

of communication, is typically regarded as a misanthrope and social outcast, who eventually left the safety of the city-walls in disgust to spend his final years solitarily wandering the mountains. Regardless of whether or not these secondhand accounts are historically accurate (which they probably are not), Heraclitus' contempt for the ordinary citizen in the surviving fragments of his work is palpable. This does not, however, contradict his emphasis upon the role of communication in philosophy, for it is only those few people who genuinely strive for wisdom who are able to truly communicate. As mentioned in the last chapter, this understanding of communication is related directly to the concept of the *logos*, which is the divine law in accordance with which all human laws are nourished. The *logos* forms the basis for the inferior, corrupted laws of the city-state from which Heraclitus would eventually remove himself, regarding the *polis* as debased by the ignorant somnambulance of the masses.

In the *Gorgias*, Plato (1997: 803) similarly equates the mass audience with 'those who don't have knowledge'. He views the techniques of the sophists as pandering to this ignorance and, as such, potentially misleading the most pliant and impressionable members of the community. In doing so, Plato makes what is possibly the first sustained critique of mass media. In a form of argumentation that has persisted to the present day, whether in cultural conservatism from figures such as F. R. Leavis, the pessimistic Marxist-Hegelian theory of Theodor W. Adorno, or the nostalgic humanism of Neil Postman, Plato's anxiety is founded upon the notion of a passive, uncritical mass audience who rely upon a higher culture produced by philosophers in order to be guided towards appropriate moral values. He finds the sophists' relativism and scepticism, which denies the ability to achieve any absolute knowledge of the world, distressing, as it actively detracts from the ability of philosophers to instruct the masses. Perhaps, he seems to believe, if the citizenry of Athens had not been so pliable, Socrates may not have been sentenced to death.

As we saw in the last chapter, Plato does not single-mindedly champion speech over writing; instead, he advocates a specific type of speech, constantly grounded in and in contact with the truth of which it speaks. Plato views this speech, an involved and personal parley between multiple participants exemplified by the Socratic method of dialectic, as in some way in touch with an originary truth, such that various other forms of communication (from the sophists' word-games to the alien

marks of writing) are always secondary representations or distortions. Thinking is 'the soul's conversation with itself' (Plato 1997: 288), and dialectic, as the most effective form of truthful speech, provides the medium for extending and elucidating this conversation. At the same time though, can Plato's valorization of such dialogue be divorced from the increasingly public nature of communication engendered by the introduction of writing? 'Communication as a person-to-person activity,' argues Peters (1999: 6), 'became thinkable only in the shadow of mediated communication'; Plato relies upon the presence of these apparently secondary forms in order to justify the superiority of his own approach to discourse. In other words, the problem with such claims for the innate authenticity of a particular modality of communication is that the supposed originarity or primacy of said mode is compromised by its reliance upon a counterpart that is posited as its inferior imitation or exteriorization, but upon which its very classification as primary is constructed.

In contrast with Plato's fairly blunt denunciation of the rhetoric practised by the sophists (even while he and Socrates would seem to partake in similar styles of argumentation), Aristotle develops a much more nuanced approach to the medium of oratory in his book *The Art of Rhetoric* (2004: 66), wherein he declares that '[r]hetoric is the counterpart of dialectic' and, as such, both techniques should be regarded as meaningful methods 'to conduct investigations and to furnish explanations'. The former, he suggests, is best used as a way for skilled philosophers to debate ideas, while the latter allows for pragmatic discussion among a more general audience. As with almost all of Aristotle's works that we have available to us, *The Art of Rhetoric* does not appear to have been intended for publication or wide dissemination – while he is believed to have written numerous dialogues and other accessible works, the only writings that have survived antiquity appear to be something analogous to lecture notes. This unfortunate fact, if nothing else, is a reminder of the extent to which our knowledge relies upon mediation. If none of the writings of Plato and Aristotle (not to mention those of the Cynics, Stoics and Epicureans) had been preserved by Latin translators in Rome after the political and cultural decline of the Greek city-states, and if those in turn had not been archived and studied by Byzantine and Islamic scholars after the fall of the Western Roman Empire, one wonders how much we would know about the great philosophers of this time at all.

The folly of representation

Plato's apprehension regarding media extended even further than just rhetoric and phonetic writing. In one of his earliest dialogues, the *Ion*, he appears sceptical of poets such as Homer and Hesiod, and the rhapsodes that perform their work, arguing that such a man 'is not able to make poetry until he becomes inspired and goes out of his mind and his intellect is no longer in him' (Plato 1997: 942) – in other words, he insinuates that poetry is not a skilled discipline in the way that philosophy is, because it does not rely upon reason, but divine inspiration, for which, he implies, human madness can be confused. This is a fairly tame insult, however, in comparison with the argument that he makes in *The Republic* (1997: 1030):

> what poets and prose-writers tell us about the most important matters concerning human beings is bad. They say that many unjust people are happy and many just ones wretched, that injustice is profitable if it escapes detection, and that justice is another's good but one's own loss.

Poets, painters and other various types of artist, Plato argues, do not create, but rather, simply represent; their role lies in making appearances rather than real things.

He explains this using the example of a bed. There is, he argues, only one true bed – that is, there is a form, or set of characteristics, that are unique to the bed as concept and which all specific instantiations of a bed have in common. God has no need for multiple beds, because in his eternal nature he has already created the flawless form of one which resides within his knowledge. When a human craftsman, by contrast, creates a bed, he is not actually producing a real bed; rather, he is producing an ephemeral, inferior *simulacrum* of that one singular, eternal, perfect bed that exists within God's mind. But artists such as painters, playwrights and poets, Plato contends, are not even capable of this. An artist does not create anything at all; they are nothing more than 'an imitator of what the others make' (1997: 1202). Hence, while the craftsman's products are, in their imitation of the perfect form, at least directly related through the process of imitation – a process that the Greeks term *mimesis* – to divine perfection itself, the work of art is, by contrast, nothing more than the copy of a copy, a product of our limited, faulty senses, completely lacking in divine essence.

For the ancient philosophers, the problem of *what* and *how* language signifies does not really exist – language is seen as valuable precisely

because it acts as a clear and unproblematic signifier of things. In the *Cratylus* (1997: 102) it is put forward that 'a thing's name isn't whatever people agree to call it – some bit of their native language that applies to it – but there is a natural correctness of names, which is the same for everyone, Greek or foreigner'. According to this account, the significative power of language is not arbitrary in its referents (as we would understand it today), but instead is directly related to the thing itself; regardless of which language or dialect is being spoken, a word is chosen precisely because it is a natural signifier of the essence of the object in question. Within this dialogue, the character of Socrates actually goes to great lengths to demonstrate, in a fairly unconvincing manner, the way in which Greek words directly relate to the object that they describe. As a consequence of this perspective, Plato views it as plausible that, through the dialectical method, we can come to speak of concepts as they actually are, rather than as we perceive them through our senses. His, in other words, is a philosophy premised upon the belief that one can transparently communicate objective truths. The problem that he faces though is that artists and poets abuse communication and representation, producing mimetic objects and delusive speeches that are able to sway the fickle, irrational masses away from the truths that philosophers could teach them.

The consequences of this, Plato goes on to argue, are nothing short of disastrous for the successful governing of the city-state. Noting that 'the start of someone's education determines what follows' in the rest of their life (1997: 1057), he seeks to understand which cultural forms would allow a city-state to produce a moral, upstanding citizenry. Poetry, he argues, has the terrible capacity to 'corrupt even decent people' (1997: 1210). In this sense, Plato views the arts as having a potentially deleterious effect upon the masses, in a similar fashion to the rhetoric of the sophists. By seeking to primarily entertain the masses, these artists do not encourage people to seek knowledge through reason, but rather, through their tragic narratives and flawed, spiritually tormented mythical heroes, seek refuge in the irrational and childish distractions of strong emotions: 'the part of ourselves that is best by nature, since it hasn't been adequately educated either by reason or habit, relaxes its guard over the lamenting part when it is watching the sufferings of somebody else' (1997: 1210).

Likewise, by not portraying the truth of the world – that is, the immutable principle of goodness that we understand as God – but instead, representing and thus deforming it, artists are able to present

moral lessons that are, in Plato's mind, manifestly false. In particular, because young people cannot necessarily identify the allegorical nature of a poem, they may mistake this for a literal truth – the whole purpose of this form of arts, he suggests, is to encourage an audience to identify with the fictional characters within it as if they were real people engaged in accurate representations of real events. Like the sophists, poets pander to their audiences and cover topics of which they hold no real knowledge. Yet while in the former case the risk is primarily that students will come to believe that they possess wisdom when in fact they are only able to produce the appearance of it, in the latter it is that citizens will effectively lose themselves in the dreamlike fantasy world of the poetic narrative, and consequently their soul will lose the vigour necessary to contemplate the world in its true reality. As Sean Cubitt (2001: 3) notes:

> Socratic philosophy was in the strictest sense conservative: its job was to preserve knowledge of the perfect world of Ideals, to distinguish between legitimate and illegitimate imitations of that ideal Reality on behalf of the population, and to bring the fallen material world back into line with its original model.

Plato's anti-populist stance is motivated primarily by a desire to literally enthrone the philosopher as the gatekeeper of knowledge.

Since the divine is, for Plato, the literal manifestation of goodness – he argues, for instance, in the *Meno* (1997: 897) that 'virtue appears to be present in those of us who may possess it as a gift from the gods' – attempting to ascertain a true understanding of objects, as opposed to the false representations spread by artists, is for him fundamentally both an ethical and political task. Plato's conception of the world is *teleological*; arguing that 'the truly good and "binding" binds and holds' everything together (1997: 85), he comes to the conclusion that the universe is not random, but rather was crafted by God with a particular end (*telos*) in mind. As such, to apprehend the truth of the world is to understand goodness in its essence, and from the sight of the character of the good, 'one must conclude that it is the cause of all that is correct and beautiful in anything' (1997: 1135). Therefore, to distract others from the possibility of reaching this truth must be considered to be less than virtuous. In a somewhat extreme move, Plato declares that all poets and artists, given their inability to portray or communicate the objective truth of the world, would be banished from his ideal city-state.

This derision of the arts that had traditionally guided Greek intellectual life (epic poetry forming the bedrock of a student's education) is again reflective of Plato's ambiguous position regarding the media of his time, perched between orality and literacy. 'Plato's exclusion of poets from his Republic', observes Ong (1982: 27–8), was in fact his 'rejection of the pristine aggregative, paratactic, oral-style thinking perpetuated in Homer in favour of the keen analysis or dissection of the world and of thought itself made possible by the interiorization of the alphabet in the Greek psyche'. In spite of Plato's hesitance regarding the pedagogical advantages of writing in the *Phædrus* (expressing less a denunciation of the medium than a more general concern relating to the nefarious uses to which language can be put), *The Republic* evinces a scientific spirit of enquiry – emphasizing clarity, precision and abstraction – that is sharply distinguished from the pre-literate arts that still dominated Greek culture at that time. In order to construct a city-state that is not misled by 'the convictions that the majority express when they are gathered together' (Plato 1997: 1115), it is clear that we must spurn both sophistry *and* these traditional arts.

Thankfully, Plato's perfect republic never actually came into existence (assuming that he ever intended such an outcome). Just as he did with rhetoric, his student Aristotle took a much more measured approach to the study of poetry; in the *Poetics* (2001: 1455), while he agrees with Plato that all forms of poetry should be considered as 'modes of imitation', he does not see this as being a necessarily objectionable thing. In fact, Aristotle (2001: 1457) declares that 'the general origin of poetry was due to two causes, each of them part of human nature'. The first of these is the use of imitation as a form of education from our earliest moments; the second is the pleasure that can come from imitating characters and events. Between this and *The Art of Rhetoric*, not only does Aristotle comprehensively rebuke Plato's contention that imitation cannot be reconciled with truth – notes McLuhan (1962: 52), 'Aristotle made *mimesis* central to his entire cognitive and epistemological world' – but his writings can be seen as the starting-point of the study of aesthetics which, along with physics, metaphysics, politics and ethics, is traditionally viewed as one of the five key areas of philosophical enquiry.

Rousseau's social contract

In Plato's time, Greece was not a unified country; rather, it was a set of culturally, politically and geographically disparate city-states that, while

sharing a common tongue, did not have any kind of unified national identity. In fact, it was only really in the nineteenth century that the modern concept of the nation-state (as a sovereign state defined not by its rulers at any one particular time but by a common set of customs, practices and beliefs united in a single identity) first arose. We witness this gradual shift in the way that philosophy was transmitted. For mediaeval philosophers, regardless of the language they spoke in everyday interactions, their work was written in Latin. This linguistic hegemony would be challenged in the fifteenth century, however, by the Gutenberg printing press and the emergence of Protestantism, the latter using the medium of print in order to publish and distribute the Bible in languages other than Latin, thus breaking the monopoly that the Catholic Church and its clergy had over Biblical interpretation. Although many philosophers during the Enlightenment persisted, at least to some extent, in the publication of their works in Latin, by the time of Immanuel Kant (1724–1804) – the most important philosopher of the period – this *lingua franca* had been entirely replaced by the vernaculars of particular nations and peoples.

Contributing to this growth in nationalism was the rise of the newspaper as a form of mass media (similarly facilitated by the popularization of the printing press), which for the first time provided readers with a sense of cultural unity rooted in their own national language; these dialects, which were once confined primarily to the spoken word, gradually came to be legitimized through such publications. These changes, along with the development of social contract theory and Westphalian sovereignty, in turn prompted the emergence of a new phenomenon: nationalism, which was in large part connected to Romanticism as a philosophical and literary movement. Romanticism (in sharp contrast to most prior philosophical traditions) actually emphasized and prioritized the role of subjective and artistic modes of experience against the rationalizing, objectifying scientific discourses.

The first true Romantic, and one of the most important contributors to this nascent nationalism, was almost certainly Rousseau, whom we discussed briefly in the previous chapter. Like Kant, whose work we will explore in much greater detail in Chapter 4, Rousseau (1987: 5) is torn between the rational thought of the Enlightenment, and the sense that this rationalism alienates humanity from its most basic virtues; as he declares, 'our souls have become corrupted in proportion as our sciences and our arts have advanced towards perfection'. Rousseau follows the British philosophers Thomas Hobbes and John Locke in

advocating the model of a social contract; in his conception, a person in their natural state is completely free, at least in their physical activity, but has little capacity for reasoning and intellectual activity in general. Consequently, although Rousseau views the state and its institutions as reducing a person's physical freedoms, he believes that this is justified in certain circumstances in order to create the sociality that truly makes one human. As Aristotle (2001: 1129) argues, the human being 'by nature is a political animal', precisely because it has a capacity for communication denied to all other creatures.

These circumstances constitute the social contract, which involves 'the total alienation of each associate, together with all of his rights, to the entire community' (Rousseau 1987: 148); freedom is enabled under such an arrangement because each person places their power 'in common under the supreme direction of the general will', that is, each person forfeits the same rights and imposes the same restrictions upon all others in order to gain the same benefits. Rousseau conceives of such a contract as entirely voluntary, for although it entails the commitment that 'whoever refuses to obey the general will will be forced to do so by the entire body' (1987: 150), one is still free to leave this contract at any time, with the proviso that this would necessarily mean leaving the nation as well. In such a fashion, Rousseau (1987: 122) – who argues that in order to create a virtuous populace we must begin by 'making them love their country' – establishes an early but crucial philosophical account of nationalism, in which citizenship is defined not merely by the relationship between sovereign ruler and their subjects, but through the articulation and enforcement of shared values. Each nation, he argues (1987: 226), should develop its own moral code – 'a purely civil profession of faith' – and although a person cannot be forced to believe in or follow this code, they forfeit their right to live within the nation if they do not do so.

This sense of nationalism, which appears so obvious now as to remain largely unquestioned within popular discourse, was a novelty at the time that Rousseau was writing, but it found great appeal among writers, artists and thinkers seeking a new sense of identity at a time when traditional fealties (related to religious belief, for instance) were being called into question by rapid advances in science and philosophy. The conservative British-Irish philosopher Edmund Burke (1993: 87), for instance, who was a sharp critic of the French Revolution and the desire of its instigators to tear up all tradition, argues that we

> are afraid to put men to live and trade each on his own private stock of reason, because we suspect that this stock in each man is small, and that the individuals would do better to avail themselves of the general bank and capital of nations and of ages.

In other words, the nation for Burke is more than just a set of geographical borders and a king or queen who rules over them; it is a medium in its own right that unites the intelligence and reason of all its members in order to rule them more effectively, and stores up the collective knowledge built up over time by this multitude. It is at least in part for this reason that he opposes the French Revolution, for in frequently changing the nature of the state, he argues, one breaks the links between generations that have allowed the nation to flourish in the first place.

From a media studies perspective, what is particularly interesting about his account of the social contract is the suspicion that Rousseau (1987: 156) expresses in regard to the influence of mass communication: in spite of his generally liberal prejudices, he argues that if, 'when a sufficiently informed populace deliberates, the citizens were to have no communication among themselves, the general will would always result from the large number of small differences, and the deliberation would always be good'. It is the very fact that people *do* communicate through various means that such deliberation is undermined, implying that we must in part subordinate our own individual will to that of the general will (and hence the nation-state) in order to avoid these effects of mass communication. Censorship in his view is an appropriate means of enforcing this general will; it only becomes corrupted when it seeks to impose values contrary to those of the masses.

This surprisingly censorial outlook must be understood within the context of a media environment dominated not by writing (as it was in Plato's day) but by the printing press, which in its mechanization of textual production not only dramatically increased the speed and magnitude of publication, but also enabled the proliferation of perspectives opposed to the official doctrines of church and state (the aforementioned Protestant Reformation, for instance, was in large part indebted to the printing press, which facilitated the large-scale dissemination of pamphlets critical of the Church and its dogma). 'The Socratic qualm about the written word giving but one unvarying answer' argues Levinson (1997: 30), found 'at least partial redress in the press, and its capacity to provide great multiples of copies of many unvarying

answers'. Yet while Rousseau is typically viewed as a pivotal influence upon the American and French Revolutions, both of which heavily relied upon the printing of seditionist pamphlets and newspapers, he actually expresses a certain scepticism regarding the social benefits of this technology.

The capacity of the printing press for 'immortalizing the extravagances of the human mind', Rousseau (1987: 18–19) claims, means that works that would otherwise have been lost to the vicissitudes of time are now preserved for posterity, providing little ability for the lesser scholar to distinguish between the good and bad. In short, Rousseau is developing his philosophy at a time when the medium of the printing press has not only weakened the ability of the sovereign to curb dissent among their subjects (for texts are no longer the precious resource, slow and tiresome to produce, that they remained under mediaeval manuscript culture), but has allowed for a plurality of expression, enabling a new kind of public communication, one that encourages disagreement and debate – hence his distinction between the general and individual will, the latter of which relying upon the communication channels opened through print.

Kant is somewhat more measured in the way that he approaches the question of freedom of expression. Having dealt with royal censorship himself in the past, he treads a fine line that attempts to argue for a liberal conception of such a freedom – as encouraged by the King of Prussia at that time, Frederick II – while at the same time avoiding the impression that he is attempting to diminish the absolute sovereignty of the monarch. In order to do this he makes an important if somewhat confusing division between *public* and *private* speech. The former, he argues, 'must always be free, and it alone can bring about enlightenment among human beings', whereas the latter may 'often be very narrowly restricted without this particularly hindering the progress of enlightenment' (Kant 1996: 18). In essence, the public use of reason is that of the scholar, directed towards a 'world of readers', whereas the private use is that of the civil or governmental worker; public reason, he argues, should not be restricted in any way by the state, but private reason may be.

What this means, for instance, is that a scholar may criticize the practices of a nation's military service, but a soldier on duty in that service may not – it is their role to follow the orders given to them and they must do so while they reside in that position. This is not to

suggest that a soldier may not ever make such criticisms, but simply that they must be made within the *public sphere*, rather than in the course of their private affairs (i.e. their role within the military). In a similar vein, he notes that in their role as a scholar a person may complain about the taxes that they have to pay, but as a private citizen they must still pay them – freedom of speech does not negate civic duty. In one sense, such a division was used by Kant primarily to justify and protect his own profession, a task that would be made all the more crucial in Prussia after the enthroning of the hedonistic, religiously zealous and anti-intellectual Frederick William II. The public use of reason was primarily the realm of the philosophers, who by necessity spoke of matters derived through reason and thus not reducible to the concerns of the state. Yet it was not confined solely to philosophers, as anyone could participate in this realm as long as they were capable of utilizing reason as the basis for their arguments, and comported themselves in the manner fitting of a scholar.

It is from this that Jürgen Habermas (1989: 104), a twentieth-century philosopher of communication, derives his concept of the *bourgeois public sphere*, stating that 'Kant's publicity held good as the one principle that could guarantee the convergence of politics and morality. He conceives of "the public sphere" at once as the principle of the legal order and as the method of enlightenment.' For Habermas it is this public sphere – a space formed not only through letters and newspapers, but also the coffee houses of London and the salons of Paris – that allowed men (for it was almost exclusively male in composition) from all walks of life to engage in rational discourse without fear of state retribution, and which was gradually weakened by the commodification of communication and media. As the media became increasingly beholden to both political actors and corporate owners, the boundaries between the public and private began to blur, leading to a 'refeudalization' that limited access to the means of public communication in order to shore up the political and economic interests of the aforementioned elites.

We will deal with many of these topics again in more detail later in this book, but for the moment it is important to note that for Plato, the first philosopher to write extensively on the topic of what we would now call political science, the successful functioning of government is heavily dependent upon the way in which the media represent truth. He perceives the injustice of Socrates' death at the hands of the Athenian jurors who chose to convict him as directly related to an intellectual decadence engendered by the immoral tales of Homer and

the empty word-games of the sophists, and thus strives to imagine a city-state ruled in line with the strictures of philosophical discussion. He is intensely suspicious of the masses and the ways that they can be foolishly persuaded through appeal to their emotions and prejudices. Such concerns regarding the way in which the media represent events for us still mark major anxieties today, with many wondering (as Habermas does) whether an increasingly commercialized media environment really affords us the freedom of intellection that a public sphere is supposed to offer us.

3 Encoding the universe

It is not especially surprising that we tend to understand the world through the media and technologies that we have available to us at any particular point in time. To a large extent, perhaps more than we are typically conscious, the way in which we communicate affects the way that we comprehend our surroundings. Media of all kinds enable us to communicate, but they also limit and shape this communication in quite profound ways. From ancient times, when speech still remained the overwhelmingly dominant means of everyday conversation, political directives and philosophical discourse, through the manuscript culture of mediaeval Europe and the gradually increasing dominance of print from the Renaissance onward, to our present age of digital computing, philosophers have used analogies derived from media in order to describe both the operation of human thought and the nature of the universe itself.

Philosophers, in fact, consistently use metaphors and analogies in order to explain their concepts. There is a strange paradox in the way that philosophy tends to seek ideal, universal concepts (even those who claim otherwise are still likely to posit abstract, privileged terms as the basis of their thought) and yet has to continually draw upon the contingent circumstances in which it is produced in order to illustrate them. Philosophers tend to be either more worldly than they claim to be, deriving their claims to transcendent metaphysical principles from the empirical situations that they disdain, or less worldly, undermining their pretence to an authentic experience of the world through recourse to *a priori* (i.e. prior to experience) categories. As we have already seen in Chapter 1, most of the pre-Socratic philosophers who formed the early tradition in ancient Greece tended to rely upon metaphors from the world around them in order to illustrate their philosophy, drawing particularly upon the chaos of their natural environment and the rule of law in the city-state. At the same time, though, these philosophers

were also beginning to present more abstract, theoretical and *idealized* ways of thinking about the world, and it is here that the logic of computing and computability, which is so hegemonic today, finds its origin.

The mechanistic cosmos

As we mentioned in Chapter 1, the pre-Socratic philosopher Anaximander challenged his mentor Thales' view that the world either is composed of or was created from water, instead proposing that all things are the result of an eternal, boundless *apeiron*, from which everything necessarily emerges and to which everything returns once it perishes. There is no obvious natural or cultural metaphor here (although there is perhaps an allusion to traditional Greek mythic motifs of immortality) but rather an abstract, universal principle invisible to the eye and yet underpinning all that we experience. It would not seem unreasonable then to suggest that Anaximander is instead drawing upon the relatively novel technics of his age. This is certainly the argument of Innis (2007: 87), who proposes that Anaximander's drawing of a 'distinction between supersensible soul substance and sensible embodiments' and the more general 'appeal to rational authority' implicit in his work are influenced by the symbolic logic of both geometry and phonetic writing. These media, which were at most a few hundred years old at his time of writing, provided the conditions for a plausible philosophical emphasis upon ideal, eternal objects rather than sensible phenomena.

Beginning with Thales, argues Serres (1995: 78), we witness the championing of '[p]ure form, whose written expression has no importance, the very trace of which can be lost without damaging the meaning, whose memory itself can be lost or die without affecting history'. Geometry, in particular, is a medium (here understood in the sense of a *technique*, a means of processing and storing information, albeit one typically still reliant upon writing) that seems to offer a transcendent *ideality* very much detached from the transience and fragility of the material world. As in Plato's valorization of speech, there is a sense that behind the axioms or postulates of geometry, there lie perfect shapes and figures that are exempted from the affliction of mediation; these forms remain able to withstand time, their apparent lack of reliance upon any material structure or ground meaning that they cannot degrade, erode, burn and so on. Once again, the technical basis of this purported ideality (its reliance upon writing and other such means of

manipulation and storage) is elided here, such that these forms appear to precede the media through which they are furnished to the human mind. The role of mediation is obscured.

A quite different example, but also notable in regard to the influence of media and technics upon philosophy, is Anaxagoras, who, like many of the pre-Socratics, was born in Ionia, but was the first to introduce philosophy and natural science into Athens. Unlike the Milesian philosophers, who tend to stick to entirely naturalistic explanations for the creation of the universe (attempting to describe the world without resorting to superstition), Anaxagoras introduces a kind of God, albeit a very abstract, non-anthropomorphic God, back into the picture through his concept of *Nous* (literally 'understanding'): a divine intelligence that is said to have control over all beings in the universe that have souls. The universe began, Anaxagoras argues, as a giant, undifferentiated mass containing all the matter that would ever exist, in the form of tiny seeds. The *Nous* set this mixture in motion, rotating it until these various parts began to centrifugally spin out and separate into their own unique objects. Anaxagoras thus envisions the universe as an enormous mechanism, operated by an external intelligence. He instantiates what Arran Gare (1993: 185) terms the 'metaphor of a machine, which as the dominant thematic motif of Western culture serves at one and the same time as the basis for interpreting the world and as an ideal for how the world should be' – marking the beginning of a common tendency within Western thought to interpret the universe in *mechanistic* terms. On the one hand, philosophers and scientists begin to conceive of the world as a machine: a collection of parts that work together towards a predetermined end. On the other hand, they also begin to view the machine as a model for how the world *should* be.

As an Athenian himself, Plato had read the writings of Anaxagoras, almost all of which are now lost, and seems to have been quite disappointed in them. In the *Phaedo* (1997: 84–5), he suggests that while this cosmological theory of the universe shows promise (in that it identifies a divine intelligence) it is unwilling to take this claim to its logical conclusion. For Plato, Anaxagoras's theory is too literally mechanistic and therefore not teleological enough – all it can do is describe the physical elements and causes of a thing; it cannot describe *why* they exist in that particular fashion. What Plato demands, then, is an understanding of the universe, beginning with the premise that things were created with a particular reason in mind. It is unsurprising then that Plato refers to

God within his writings as the *demiurge* (literally 'craftsman'). Although he does not use as literal a mechanical metaphor as Anaxagoras, he views the universe as being crafted with certain goals in mind. Things do not merely exist but were created according to a particular logic. Xenophon (1990: 90) also records Socrates making a very similar argument, stating that the complex and seemingly thoughtful compositions of the human body 'seem very much like the contrivances of some wise and benevolent craftsman'.

In arguing for a rationally designed universe in this fashion, Plato takes some inspiration from another set of pre-Socratic philosophers: the Pythagoreans. Almost nothing is known about Pythagoras himself, but what we do know is that his ideas spawned two prominent cults of followers that sought to put into practice his teachings. While the Pythagoreans held a number of important and influential beliefs and conventions, including reincarnation, vegetarianism and a confidence in the equality of women that was very uncharacteristic of its time, what they are best remembered for is their belief in the divine importance of mathematics. The Pythagoreans, 'who were the first to take up mathematics', writes Aristotle (2001: 698), believed that 'its principles were the principles of all things'. They viewed the world as composed of individual parts that are both interconnected and separate and, as such, they understood all things to be not only describable through mathematics, but actually in themselves mathematical.

As with Anaxagoras, the Pythagoreans' philosophy can only be understood within the context of the specific media developments of their time. The ability to perform mathematical calculations efficiently through the use of written symbols made possible a belief in the existence of abstract, eternal forms – a right-angled triangle in algebraic form is a perfect shape. Of course, that perfect shape will never appear in the sensory world; all we will see are distorted, inferior imitations of it. Thus it is logical to imagine a realm composed entirely of these perfect, eternal geometric shapes – 'this abstracted object, divorced from concrete situation, no longer needs to be visualised; in fact it cannot be' (Havelock 1963: 219) – and to view this realm as superior to the messy, disordered materiality of the world in which our bodies reside. Postman (2005: 23) argues that, even in our present age, our obsession with quantification means that we 'come astonishingly close to the mystical beliefs of Pythagoras and his followers who attempted to submit all of life to the sovereignty of numbers'.

Plato appears to follow the Pythagoreans in seeing the abstract methods of mathematics as a potential road (in addition to dialectic) to ascertaining the true form of objects – as Ong (1982: 79) suggests, 'Plato's entire epistemology was unwittingly a programmed rejection of the old oral, mobile, warm, personally interactive lifeworld of oral culture.' In *The Republic* (1997: 1142) for instance, Plato proposes that arithmetic 'leads the soul forcibly upward and compels it to discuss the numbers themselves, never permitting anyone to propose for discussion numbers attached to visible or tangible bodies'. This is a consistent theme throughout his oeuvre; a philosopher trains his mind to apprehend the forms through the application of pure reason, divorced from the distractions of the material world. This leads him to the rather odd conclusion that death is the optimum state for the philosopher, given that in separating the soul from the body it allows for contemplation free of *any* material constraints.

Plato's theory of forms entirely discounts the notion that one can or should seek knowledge through appearances and physical phenomena, viewing the world as effectively encoded by God – all we need to do is learn to understand that code, which is presented as the forms. In the *Timeaus* (1997: 1256) he goes as far as to argue that God composed all bodies in the universe out of triangles, which then in turn form other geometrical shapes. And yet the irony is that the calculation of triangles, and all of these mathematical operations that he discusses, are surely not truly separate from the material world (i.e. exempt from processes of mediations); rather, they are themselves the products of observations and technical practices. Plato tacitly himself admits as much when he states that 'our ability to see the periods of day-and-night, of months and of years, of equinoxes and solstices, has led to the invention of number and has given us the idea of time and opened the path to inquiry into the nature of the universe' (1997: 1249).

But mathematics was more than just a product of observing the natural world; it also relied upon the development of writing as a medium for the storage and processing of information. We can perhaps argue that it is not simply eternal and given, but emerges out of a specific process of mediation. This contradiction is what N. Katherine Hayles (1999: 12) describes as the 'Platonic backhand':

> The Platonic backhand works by inferring from the world's noisy multiplicity a simplified abstraction. So far so good: this is what theorizing should do. The problem comes when the move circles around to constitute the

> abstraction as the originary form from which the world's multiplicity derives.

To put this simply, Plato derives abstractions from the world around himself in order to be able to define specific forms. But then, in a bizarre reversal, he presents these abstractions as if they are the original form from which the surrounding world is produced. The forms become transcendent, metaphysical entities entirely divorced from the world itself, and yet somehow they also come to be seen as providing the very structure of the world. What Plato did not seem to recognize is that, as Vilém Flusser (2002: 65) puts it, 'man himself becomes a tool of his own tools' – Plato's philosophy did not exist outside of the influence of the media forms that he decried. Abstract thought, divorced from the qualities of tangible objects, was in large part enabled by the written word, formalized mathematics and geometry, and as a result Plato was able to envision a theory of forms entirely distinct from the seeming imperfections of the material world. Plato conceives of the entire universe in geometric form and, as such, regards it as comprehensible as long as we are able to train our minds correctly.

There is no apparent metaphor deployed in Plato's cosmological account; when he speaks of the world as composed of triangles, this is because he understands geometry to be the basic material with which God the *demiurge* constructs his perfect forms. Thus while, as Kittler (1990: 265) notes, 'to transfer messages from one medium to another always involves reshaping them to conform to new standards and materials', for Plato this process of mediation does not occur when a philosopher speaks of the forms in themselves, as they are simply reading the perfect geometric language of God – the code with which the machine of the universe was built. Rather, it occurs in the realm of appearances, in the *simulacra* that lie like a veil over our senses, in the inferior copies that we produce and, even more so, in our attempts through painting, poetry, writing and the clever but empty rhetoric of the sophists, to create representations of these already corrupted copies.

For Plato, mediation is a problem to be overcome – mathematics and geometry act for him as important means for understanding the world, and in particular for seeking a realm of stable knowledge outside of the ever-shifting contradictions of everyday perception. Yet what he fails to recognize is that his method of moving beyond appearances to the things themselves is itself a mediation; he is not seeking out objects in

their purest configuration, but rather is abstracting *from* appearances to produce a new, more refined form. The Platonic method – the earliest iteration of what would come to be known as *rationalism* – is, in other words, reductionist. Plato may be hesitant when faced with the technological developments that were occurring during his life, but his entire system depends upon them.

The Book of Nature

Hampered by cumbersome numerical systems, these claims for the intellective supremacy of mathematics never really took off in ancient or early mediaeval Europe; the mathematical disciplines remained terribly crude among Western Europeans until the thirteenth century, when Leonard Fibonacci (*c.* 1170–1250), an Italian mathematician, imported the Hindu–Arabic number system that we still use today. This new system of notation revolutionized Western understandings of mathematics. The previous system (still seen today in certain specialized uses) as inherited from the Romans, who had in turn adopted it from the Greeks via the Etruscans, may have enabled the early philosophers to dream of abstract truths encoded in geometrical form, but in practice it acted as a fairly decisive barrier to the development of calculative thought in Western Europe.

The Romans improved upon the Greeks' system by allowing numerals to be subtractive as well as additive (so, for example, IV represents four by subtracting I from V), but on the whole, neither system was conducive to representing large numbers in a convenient format. The lack of consistent use of the number zero – the suspicion of which quite possibly began with Parmenides' influential argument that something cannot be *nothing* (McLuhan & Logan 1977) – made keeping the records necessary for commerce unwieldy and restricted the development of mathematics as a discipline. By contrast, the Hindu–Arabic system brought in by Fibonacci, which did include the number zero as a crucial and coherent element, allowed for the simple representation of large numbers by using this numeral as a placeholder. Merchants rapidly adopted it and by the sixteenth century Roman numerals had been largely superseded in the West, boosted by other significant additions to numerical notation, such as that of Johann Widmann, who in 1489 first developed the plus and minus signs which not only made tasks such as bookkeeping far easier, but would soon allow for the emergence of algebra.

The first philosopher to really reflect these advances within their work was René Descartes (1596–1650), a French polymath whose remarkable achievements in a number of fields still, for better or worse, resonate today. A gifted mathematician, Descartes developed the system of *analytic geometry* (also known as *Cartesian geometry*), which overturned many of the assumptions that had previously guided the field from Euclid's axioms onward. Most notably, as well as first establishing a definite relationship between the study of algebra and that of geometry, he introduced the use of coordinates, which allowed both for algebraic equations to be represented as geometric shapes (and *vice versa*) and for points in space to be identified through the *ordered pair* (*x* and *y*), or *ordered triple* (*x*, *y* and *z*) if it is three-dimensional space. Most important for our purposes, however, is his philosophical system, which represents a radical shift in the underlying assumptions of philosophical study – beginning to 'strive towards a reduction of philosophy to precise mathematical form' (McLuhan 1964: 175) – and which has led to him often being referred to as the first truly modern philosopher. Descartes (2003a: 12) was a scientist as much as a philosopher and this is reflected in his theories:

> the sciences found in books – at least those which are only probable and do not contain any demonstrations, since they were composed and developed gradually from the views of many different people – do not come as close to the truth as the simple reasoning that a person with common sense can perform naturally about things that they observe.

To understand Descartes' contributions, however, we must first consider the intellectual milieu within which he worked. The desire to overturn received wisdoms, as expressed in the quotation above, is already present in the work of Francis Bacon (1561–1626), a Renaissance philosopher whose influence upon science is perhaps unrivalled. Trained in the methods of the mediaeval scholastics, who viewed humanity's Fall as being the result of an excessive greed for knowledge, and therefore regarded philosophy (which of course then included what we would now refer to as the natural sciences) as the art of preserving, refining and synthesizing, rather than expanding pre-existing knowledge in line with Biblical texts and doctrinal teachings, he grew up in a philosophical culture that assumed truth to have been largely determined by those living millennia earlier.

Scholasticism was a philosophical movement that dominated Western European thought from the twelfth century – beginning with

Anselm of Canterbury (*c.* CE 1033–1109) – through to the fourteenth, when it came to be gradually displaced by Renaissance humanism and scientific empiricism, as exemplified by Bacon himself. The scholastics sought to synthesize Christian beliefs and scripture with the philosophy of Aristotle, whom they held in such esteem that he was typically referred to simply as 'The Philosopher'. Along with Aristotle, they also incorporated some of the ideas of Plato (which they derived mainly from Saint Augustine, whose works mark the end of ancient philosophy and the beginning of the mediaeval tradition that would last, albeit fitfully, until the fifteenth century), as well as the Islamic philosopher Avicenna (*c.* 980–1037) and the Jewish philosopher Maimonides (1135–1204). These thinkers, who worked within the earliest manifestations of the university system, had the advantage of relatively sweeping access to a wide range of philosophical manuscripts that they could consult and compare, in contrast to the scarcity of texts available to the writers of antiquity.

For most scholastic philosophers, the world is an orderly, rational collection of fixed laws and effects, all following a divine plan (*teleology*) set out in advance by an all-knowing, all-powerful God. In a sense, the world appeared to them as a book to be read. They thus divided knowledge between two sacred texts: the Book of God (i.e. the Bible) and the Book of Nature. Bacon (2000: 37) retains this division, noting that the Book of Nature allows us to potentially discern 'the true prints and signatures made on the creation' by the divine creator. But at the same time he also challenges the scholastics' belief that the Book of Nature had already been set out in Aristotle and was only in need of synthesis with the truths of the Bible. Instead, Bacon (2002: 126) challenges their belief that the study of nature is a form of contemplative, hermeneutical enquiry analogous to their precise studies of the Bible, writing:

> let no man upon a weak conceit of sobriety or an ill-applied moderation think or maintain that a man can search too far, or be too well studied in the book of God's word, or in the book of God's works, divinity or philosophy; but rather let men endeavour an endless progress or proficience in both.

The reason for humanity's fall from grace, he proposes, was not its desire for a pure knowledge of nature's laws; rather, it was the ambition for a moral judgement that would allow it to ignore God's laws and formulate new ones for itself. Consequently, it should be the aim

of the philosopher to continually seek out new knowledge, rather than remain satisfied at any one moment.

Intensely critical of his predecessors' reliance upon the authority of the Greeks, Bacon (2000: 7) observes that, with scholasticism, the sciences 'almost stopped in their tracks, and show no developments worthy of the human race', while in the realm of technics new inventions were ever forthcoming. In particular, he calls into question the 'poor authority of philosophies founded on common notions or few experiments or superstition' – most notably the 'fantastic, high-blown, semi-poetical philosophy' of Plato, which seduces the intellect through its abstract appeal to transcendent forms and teleologies (Bacon 2000: 53). Bacon (2000: 18, 33) is an unabashed empiricist, arguing that the intellect 'is found to be much more prone to error than the senses', thus making any form of enquiry from first principles fruitless and likely misleading: 'Man is Nature's agent and interpreter; he does and understands only as much as he has observed of the order of nature in fact or by inference; he does not know and cannot do more.' The problem with the Greeks, he suggests, is that they relied too heavily upon fanciful speculation and felt no real need to empirically validate such conjectures, a situation only intensified by the scholastics' reverence for Aristotle. As such, he marks a crucial turning point in the history of philosophy; Enlightenment, note Horkheimer and Adorno (2002: 1), 'wanted to dispel myths, to overthrow fantasy with knowledge', a process which began with Thales, but which is vastly amplified by Bacon, who views even the methods of the Greeks as being clothed in superstition and myth.

What is needed, Bacon (2000: 28–9) proposes, is for 'the entire work of the mind be started over again; and from the very start the mind should not be left to itself, but be constantly controlled; and the business done […] by machines', given that 'in any major work that the human hand undertakes, the strength of individuals cannot be increased nor the forces of all united without the aid of tools and machines'. In this case, the machines of which he speaks are fixed rules of scientific enquiry, bolstered by a constant and scrupulous recording of all observations. Such methodological exactitude, assisted by the use of technical media, would have a profound influence upon subsequent science and philosophy. We certainly see this in Descartes, who contributed to this theory a thoroughgoing scepticism in regard to the distortions that he saw as plaguing our normal perception and understanding of the world.

Whereas Bacon was an empiricist who sought truth through inductive reasoning, moving from observations of particular instances to the extrapolation of general laws, Descartes represented a return, albeit in a much more sophisticated form, to the deductive rationalism of Plato, utilizing universal laws derived from logic and mathematics to explain the world around himself. In particular, Descartes (2003a: 9) sought to build his philosophical system upon 'clear and intelligible' thoughts, free of all distortion, prejudice and superstition. Superficially, this was once again not necessarily much different in principle to Bacon's attempt to sweep the world of its 'idols'. On deeper inspection, however, Descartes' project represented a decisive shift in the way that philosophers conceived of knowledge and mediation.

Where Bacon was the emblematic philosopher of the scientific revolution itself, Descartes was the first of those philosophers who were the *products* of this era. Most notably, his philosophy was undoubtedly influenced in great part by the momentous scientific discoveries of Nicolaus Copernicus (1473–1543) and Galileo Galilei (1564–1642). Copernicus formulated the heliocentric model of the universe, in which the Earth revolved around the sun, and Galileo improved upon the design of the refracting telescope to the extent that he was not only able to confirm, with considerable controversy, the validity of Copernicus's heliocentrism, but to observe hitherto unknown characteristics of the solar system, such as Jupiter's four largest moons, or the presence of sunspots. Galileo was also an early innovator in the use of the microscope, studied the dynamics of falling bodies, foreshadowing Isaac Newton's discovery of gravity, and conceived of a universal clock, premised upon the orbit of Jupiter's moons, that would allow him to calculate longitude.

Perhaps more so than any other figure during the scientific revolution, Galileo's innovations came not just from his empirical observations, but also from his ability to characterize these observations in mathematical and geometrical terms. It wasn't that his mathematics was particularly novel in its own right, but that he was able to utilize it to practical ends in ways previously unthought of. In this fashion, Galileo represented a decisive break in philosophical thought, exemplified in his famous claim that

> philosophy is written in the all-encompassing book that is constantly open before our eyes, that is the universe; but it cannot be understood unless one first learns to understand the language and knows the characters in

> which it is written. It is written in mathematical language, and its characters are triangles, circles, and other geometrical figures.

The notion of a universal language was of course not new; the notion of the *logos* in the writings of Parmenides and Heraclitus exemplifies a similar principle conceptualized in the form of spoken discourse, and likewise for the scholastics and their positing of a Book of Nature waiting to be interpreted by philosophers. As can be seen in the quote above, Galileo had no doubts regarding the existence of such a book; what differentiated him from the scholastics was that he believed it was written in the language of mathematics. This was the crucial break between the scientific revolution and the Age of Enlightenment. Mathematics replaced grammar as the primary medium through which truth could be ascertained. We see here so clearly the way in which the media of the day affected philosophical discourse – the application of mathematics to the natural sciences completely altered not only the method of ascertaining truth, but the perceived form of the truth itself. Suddenly, the world became mathematical, as it had been for the Pythagoreans and even Plato to some degree.

More than just this, however, Galileo's revolutionary usage of the telescope as a medium for observation further contributed to a shift in scientific thinking in two ways. First, by confirming Copernicus's then-heretical hypotheses regarding the nature of the universe, at significant personal cost, Galileo offered a powerful (albeit not necessarily deliberate) rebuke to the authority of the Church. For what Galileo demonstrated was both that church doctrine could not be relied upon in light of rigorous scientific experimentation and that science could not simply be viewed as a means of confirming through reason what was already known through faith. Suddenly, science as a discipline was recognized as having the ability to undermine the power of religious authority; hence Galileo's trial for heresy and forced recantation. Second, it contributed to the legitimacy of his mathematical understanding of truth by effectively denaturing the once-presumed reliability of the senses. If McLuhan (1964) is correct in arguing that a medium can be defined as any technology that extends the senses or body of a person, then few media have extended the human senses further than that of the telescope and, in doing so, it revealed the weakness of the Aristotelian model of empiricism, premised upon the senses as arbiters of truth, that still remained dominant in Bacon's scientific model. With Galileo, as Joseph Vogl (2008: 18) puts it, 'what the

eye sees is deception as much as it is truth. Vision has lost its status as natural evidence.'

Under such circumstances, in which sight still remains the privileged metaphor for knowledge, emphasizing the 'visual shaping of spatio-temporal relations' (McLuhan 1962: 20), yet the assuredness of sensory data as a means of attaining such knowledge is called into question, the notion of mathematical theory – the abstract forms that Plato had viewed as underpinning all truth – once again becomes plausible as a result of the realization that sight is no less (and perhaps even more) arbitrary than these symbolic forms of representation. The aim of science under Galileo's influence, therefore, becomes less one of eliminating those 'idols' that cloud our senses, as in Bacon's empiricism, and more one of seeking out universal truths not at all reliant upon such sensory perceptions.

The irony is that at the same time as the telescope enabled a vast increase in empirical knowledge by revealing parts of the universe previously unseen and unknown, it also further undermined the certainty of the largely static conception of knowledge that had reigned during the mediaeval era by revealing the vast, possibly endless spaces that were still unexplored by humanity. Bacon's claim that the search for knowledge is effectively endless, that there is no final state of absolute knowledge, is confirmed in the medium of the telescope. Likewise, the position of the human being in relation to the cosmos as a whole is radically altered. No longer could it be justifiably understood that the universe, not only in physical terms, but also in figurative ones, revolved around the Earth and the intelligent beings that resided upon it. Galileo's discoveries relativized human consciousness, placing it as an observer – and a potentially unreliable one at that – within a world unimaginably greater than itself. 'The use of the telescope assumes the invention of the subject, which will place itself on the right side of the viewfinder, contemplating, observing, calculating, arranging the planets' (Serres 1995: 80).

Descartes' key piece of writing in this respect is the *Meditations on First Philosophy*, in which he seeks to lay out the means by which clear and intelligible – and thus truthful – thoughts can be ascertained. Sitting alone by his fire, he reflects upon all the errors, distortions and falsehoods that he had accumulated over the years, and decides that in order to provide a more solid foundation for further inquiries he must attempt to eliminate not only those ideas that he recognizes to be false, but all preconceived opinions that reside in his mind. We see the

influence of Galileo's decisive medial developments in such a claim; this image of Descartes sitting alone beside his fire, allowing the material world to dissolve away, reflects the aforementioned denaturing of the senses effected by the telescope.

In order to do this, Descartes (2003b: 22) realizes, he must begin from a position of absolute, radical doubt:

> I will suppose that, not God who is the source of truth but some evil mind, who is all powerful and cunning, has devoted all their energies to deceiving me. I will imagine that the sky, air, earth, colours, shapes, sounds and everything external to me are nothing more than the creatures of dreams by means of which an evil spirit entraps my credulity. I shall imagine myself as if I had no hands, no eyes, no flesh, no blood, no senses at all, but as if my beliefs in all these things were false. I will remain resolutely steady in this mediation and, in that way, if I cannot discover anything true, I will certainly do what is possible for me, namely, I will take great care not to assent to what is false, nor can that deceiver – no matter how powerful or cunning they may be – impose anything on me.

In short, what he realizes is that he is unable to ever fully trust his own senses, since the possibility always exists that what he perceives as being an external world is nothing more than a simulation imposed upon his mind by an evil demon.

What Descartes can trust, however, is the presence of his own thought. Although it is possible for him to imagine himself without any body, any senses, any corporeal existence, he decides that it is not possible for him to imagine *himself* – that is, his consciousness – not existing, for how could one imagine such a thing without a mind? This leads him to quite possibly the most famous and notorious philosophical statement ever made: 'I think, therefore I am' – or as it is often rendered in Latin, *cogito ergo sum* (Descartes 2003a: 25). This does not mean that Descartes lapses into absolute scepticism. A substantial portion of his meditations are devoted to a (fairly dubious, or at least logically circular) demonstration of the existence of God, based in large part upon Anselm of Canterbury's *ontological argument*, and as a result his final conclusion is that the existence of two things – the mind and God – could be proved to exist, and since it would be against His nature for God to mislead humanity, Descartes considers it logical to deduce that he is not alone in the universe, but rather, lives as part of a world composed of things created by God.

Descartes (2003a: 16) decides that it is theoretical – specifically mathematical – knowledge through which truth will now be located; in the past, he observes, 'among all those who had previously searched for truth in the sciences, mathematicians were the only ones who were able to find some demonstrations, i.e. inferences which were certain and evident'; it is logical therefore, that these should be the starting points for a new, decidedly anti-Aristotelian metaphysics. 'The only arguments Descartes would accept for reasons of their unsurpassed clearness and distinctness', notes Kittler (2009: 27–8), 'were (strangely or perhaps evidently enough) the operators and operands of modern algebra.' God, Descartes argues, created the world according to consistent, eternal laws, and in order that we might come to understand them, he also implants ideas in our minds that correspond to these laws. It is consequently the role of the rational individual to apprehend these laws and to utilize them to develop clear and distinct thoughts about all things in the world.

Thus is inaugurated the rationalist stream of Enlightenment philosophy; deductive rather than inductive, it posits the abstract calculations of mathematics and geometry as the universal medium through which the truths of the world can be decoded, in contrast to the media of the senses, which are inherently untrustworthy. Such contentions became the dominant mode of philosophical thought in continental Europe during the seventeenth century, evident most notably in the work of two of Descartes' more original followers: Benedict de Spinoza (1632–77) and Gottfried Wilhelm Leibniz (1646–1716).

Spinoza was a Dutch lens grinder, who despite never holding a major academic position, and publishing few of his works during his lifetime, produced one of the strangest and most remarkable philosophical systems of this period. Although he notes that Descartes 'laid the unshakable foundations of philosophy on which numerous truths could be built with mathematical order and certainty', Spinoza (1998: 2) does not make the same claims that Descartes does regarding mathematical demonstrations as the basis of true thought. What Spinoza (1992: 103) does argue, however, is that we should 'consider human actions and appetites just as if it were an investigation into lines, planes, or bodies'. Although he does not extend to mathematics the metaphysical primacy offered by Descartes, Spinoza is convinced that, in order to encourage clarity of argument and expression, philosophy needs to be composed in a more mathematical format. The result of this is that the *Ethics*, his most notable work, is composed in a 'Euclidean' style, laying

out his philosophy with definitions, postulates and axioms, followed by propositions, proofs and scholia. Recent developments in media had, in this case, not only altered the content of philosophy, but its *form* also.

Whereas Spinoza chose a largely ascetic life devoid of fame or wealth (although he certainly was not free of notoriety), Leibniz, with whom he had corresponded, loomed as an intellectual giant over European philosophy in the late sixteenth and early seventeenth centuries. Like Descartes, he was a formidably original mathematician; for instance, although he may not have been the first person to discover infinitesimal calculus (Newton claimed that he deserved this honour, leading to a fairly major intellectual dispute), it is certainly his form of notation which is still used today. Likewise, he made important contributions to the field of physics, often disputing Newton's classical mechanics with theorems that would only gain widespread support during the twentieth century, contributed significantly to the field of formal logic and was also an impressive inventor.

In philosophy, Leibniz (2005: 52) followed Descartes in arguing that human beings are distinguished by their 'knowledge of eternal and necessary truths', as laid down by God, who created the world in a perfect form, and who in His infinite power of knowing at every point in time continues to choose the most perfect set of circumstances for the universe. The universe is, for Leibniz (2005: 61), effectively an enormous, perfectly wound-up mechanical machine designed by God and composed of numerous smaller machines, including human beings: God is to his subjects as 'an inventor is to his machine'. Leibniz also continues Descartes' emphasis upon the metaphysical priority of mathematics, extending this notion in order to conceptualize the *characteristica universalis*, a proposed universal language through which logical, mathematical, scientific and metaphysical arguments could be essentially calculated. This emphasis upon calculation is vitally important and is indicative of a major shift between Renaissance and Enlightenment thought. Writes Michel Foucault (1970: 69):

> to make use of signs is not, as it was in preceding centuries, to attempt to rediscover beneath them the primitive text of a discourse sustained, and retained, forever; it is an attempt to discover the arbitrary language that will authorize the deployment of nature within its space, the final terms of its analysis and the laws of its composition. It is no longer the task of knowledge to dig out the ancient Word from the unknown places where it may be hidden; its job now is to fabricate a language, and to fabricate it

> well – so that, as an instrument of analysis and combination, it will really be the language of calculation.

In simple terms, although Galileo still retained the essentially scholastic notion of a Book of Nature, albeit one written in mathematical language, his philosophical progeny reject the notion of a static, divine text that is only in need of being deciphered.

Instead, for these rationalist philosophers, who extend Bacon's conceptualization of knowledge as an endless quest to its logical limits, knowledge becomes a productive act; the purpose of Leibniz's proposed universal language is to not to read an inscribed truth of some kind, but to provide a consistent set of symbols with which truth can be formulated. Calculation, we must remember, is a very different activity to reading. Although it would be incorrect to consider the latter a passive activity, given that reading a text is always a process of interpretation and negotiation, the difference lies in the fact that calculation is a form of analysis that does not rely upon a pre-existing text to analyse; rather, it seeks to classify, measure and predict according to a universal sign system. This is as much the case for Descartes and Spinoza as it is for Leibniz, but it is only in the latter's dream of a universal language that the differences are really illuminated – the belief that all knowledge, all truth can be encoded in a calculable form, implicitly dismissing all that might not conform to such a schema as irrational falsehood, demonstrative of nothing more than the inherent limitations of human thought. 'Through a shared language', argues Michael Heim (1993: 37), Leibniz believes that 'many discordant ways of thinking can exist under a single roof', hoping that this universal calculus could in some way emulate the omniscience of God.

Perhaps the most interesting aspect of Leibniz's *characteristica universalis* is his remarkably early conceptualization of binary computing. Experimenting with different ciphers for encrypting messages, it had already occurred to Bacon that all letters of the alphabet could be converted into discrete combinations of the letters A and B. It was Leibniz, however, who first recognized that by encoding language into series of 1s and 0s, mathematical calculations could be automatized and thus performed without the need for human intervention. Although this was never actually put into practice during his lifetime, Leibniz (2006: 39) placed a great deal of significance on this realization; while it is possible that he was not a particularly devoted Christian, he did constantly stress the importance of God in creating and maintaining the world

and, as such, argues that the numbers 1 and 0 symbolize 'the continuous creation of things from nothing'. The importance of this for the mutually intertwined development of media and philosophy cannot be understated; Leibniz sees the binary, digital form – 'an artificial language remote from the words, letters, and utterances of everyday discourse' (Heim 1993: 94) – as being implicated in the cosmological origins of the universe.

'We stand at such a crossroads of digital and analog/print information technology now,' writes Levinson (1997: 18), 'much as Socrates and Plato conversed and wrote at a crucial intersection of oral and written modes.' If we can postulate that, from Plato's comparison of the soul to a wax tablet onward, Western philosophy has quite consistently relied upon medial metaphors to characterize its metaphysics, then what we see in the movement of Enlightenment rationalism is a shift from the Book of Nature to Leibniz's *calculus ratiocinator*: the universal computer. Is it possible that we still think of the universe in these terms and, if so, how might it constrict (as well as enable) the ways in which we communicate?

4 The question of objectivity

When we study media – and in particular, when we examine the assumptions and practices of journalism – we often interrogate the concept of *objectivity*, questioning whether it is possible for the media to report events in a truly *objective* manner. Although this concept has come to designate a specific set of principles within journalism (for instance, reporting news fairly, factually and in a disinterested manner) and a complementary set of practices, objectivity is at its core a philosophical concept – one that relates directly to the questions of epistemology (i.e. the scope and limitations of human knowledge) that have been asked from the ancient Greeks onwards. In this chapter then, we will attempt to outline some of the crucial ways in which objectivity has been conceived in the Western philosophical tradition.

The object in ancient philosophy

In his early dialogues, Plato evinces no strong interest in metaphysics; the debates that he depicts between Socrates and his various interlocutors tend to focus primarily on questions of ethics and the possibility of knowledge. At this stage, the method of dialectic is genuinely investigative, whereby Socrates identifies the contradictions within a given hypothesis by the person with whom he is debating and, as a result, attempts to negate its premise, demonstrating that these contradictions make it untenable. The end result of many of these dialogues is a state of *aporia*, in which neither Socrates nor any of his interlocutors are able to proceed any further with their enquiry; they are no longer able to speak on a subject and, as such, possess only the knowledge of that which they do not know. Dialectical enquiry, in this context, offers a humbling wisdom of sorts. Many of these dialogues involve the characters attempting to define various terms in singular and indivisible terms – for example, *Crito* deals with justice; *Euthyphro* with holiness and piety; *Hippias Major* with beauty; and *Lysis* with

friendship. Within these dialogues, the Socratic method becomes a negative method through which terms can be whittled down to their most basic, incontrovertible form. There is no suggestion, however, that this is anything more than an enquiry into everyday, seemingly mundane concepts.

By the time of *The Republic*, however, this method of enquiry has changed somewhat. Gone are the modesty, humility and aporetic conclusions that characterized the early dialogues; now the character of Socrates is making broad, often remarkably ambitious claims about the world and the possibilities of human knowledge. It is at this point that Plato first develops his 'theory of forms' that in many ways comes to define his middle period. Suddenly, when he seeks to understand virtues such as beauty or justice, he is not simply seeking out the most accurate definition, but rather sees these values as immaterial forms, or 'Ideas'.

This theory, in which the truth of the world comes to be seen as inaccessible to the senses, and thus only apprehensible through the use of pure, dialectical reason, is most famously depicted in his allegory of the cave:

> Imagine human beings living in an underground, cavelike dwelling, with an entrance a long way up, which is both open to the light and as wide as the cave itself. They've been there since childhood, fixed in the same place, with their necks and legs fettered, able to see only in front of them, because their bonds prevent them from turning their heads around. Light is provided by a fire burning far above and behind them. Also behind them, but on higher ground, there is a path stretching between them and the fire. Imagine that along this path a low wall has been built, like the screen in front of puppeteers above which they show their puppets.
>
> […]
>
> Then also imagine that there are people along the wall, carrying all kinds of artifacts that project above it—statues of people and other animals, made out of stone, wood, and every material. And, as you'd expect, some of the carriers are talking, and some are silent.
>
> (1997: 1132–3)

All that these prisoners can apprehend are the shadows projected onto the wall; they do not see the people and the objects they are carrying in themselves, only their distorted traces in the flicker of the firelight. When the sound of the passers-by speaking echoes off the

cave wall, they presume that it is coming from the shadows. When they themselves develop language to describe the world around them, their words refer to these shadows. 'The prisoners would in every way believe that the truth is nothing other than the shadows of those artifacts' (Plato 1997: 1133).

This world of shadows, in a nutshell, represents the sensory world – that of ordinary, non-philosophical experience: when we perceive of things, what we are seeing are nothing but distorted *simulacra* of the static, eternal forms that reside within the mind of God. So, to return to the example used in Chapter 2, a bed produced by a carpenter cannot be anything more than an inferior copy of the perfect form of a bed. The fact that there are numerous different beds within the world is testament to this fact – they are all faulty copies. This same observation applies to literally everything that we perceive through the senses – people, objects, natural features and even virtues such as beauty or justice. We live in a world of appearances and hence distortions.

The corollary of this is that while we may perceive the world as being constantly in flux – that is, *becoming* – the perfect forms that presuppose this world are in fact entirely static, otherwise known as the state of *being*. The similarities to Parmenides' argument here should be obvious and, in fact, it would appear that one of the motivations behind Plato's theory of the forms is to reconcile the thought of two of his greatest philosophical influences: Heraclitus and Parmenides. Whereas Parmenides viewed the world as entirely without motion, Heraclitus saw it as constantly shifting – formed out of fire, its shape changes as this fire is perpetually kindled and extinguished. While one can argue that Heraclitus's views are actually not that distinct from Parmenides', in that he seems to acknowledge the existence of a stable *logos* underpinning the cosmos, it is clear that Plato (1997: 170) viewed him as claiming that '[w]e are wrong when we say they "are", since nothing ever is, but everything is coming to be'. As such, Plato found himself under the influence of two philosophers with diametrically opposed metaphysical understandings of the world. The theory of forms becomes the means by which he seeks to reconcile these two competing beliefs, combining the Heraclitean flux of sensory perception with the static, eternal Parmenidean forms.

The end result is a rather distinctive theory of objectivity, whereby one's subjective experience of the world is *always* just an inferior copy of an objective truth from which it is derived, and which one will never experience as long as one relies upon sensory perception. Given his

scepticism regarding writing (or more precisely, an over-reliance upon writing at the expense of other, more enlivening modes of communication and pedagogy), there is only one medium in Plato's conception that is adequate for grasping this objective truth, and that is the spoken art of dialectic. He is able to make this claim precisely because he *does not view speech as a medium*; instead, he understands the spoken word as the soul (where this truth is inscribed) escaping the body.

Put simply then, Plato has no doubt that an objective truth – that is, the veracity of a reality that lies outside of, and thus is not at all dependent upon, subjective experience – exists, but he believes that it is only philosophers who are able to gain access to it. This is because it is only philosophers who are able to whittle down concepts to the point where they accurately describe the reality of that which they are referencing. Plato thus offers what is typically referred to as a *correspondence theory of truth*, which argues that a statement is to be regarded as true when it corresponds accurately to an actual state of affairs. Thus, for Plato, a statement is true not when it describes one's subjective experience, but when it adequately describes the forms from which that experience is derived. Most importantly, when thinking in terms of media, Plato does not accept that there is any means by which this truth might be adequately represented – one must find the truths written in one's soul; one cannot communicate these truths to others (even though one may use dialectic to assist them in their own journey towards this truth).

British empiricism

Although the philosophers of antiquity had diverse views on the question of truth and objectivity, they tended to fall into one of two groups: either they believed in the straightforward existence of facts independent of human thought but nonetheless apprehensible through it (idealism or realism), or they called into question the very possibility of knowing such truths, or even whether they exist at all (scepticism). In Western Europe, philosophy moved quite unambiguously towards the former option as Christianity became dominant. Particularly influential in that case was Saint Augustine's claim to the equivalence between Plato's Ideas and the Christian God, emphasizing that truth can be sought both through rational enquiry and mystical revelation.

It is with the scientific revolution of the fifteenth century, then, that philosophers began to question exactly what objective truth might be

and how it might be acquired. We already know from Chapter 3 that Francis Bacon's empiricism sought to discourage reliance upon the texts of ancient philosophers, and to spur philosophers to observe the world around them in order to attain new insights. We also know that, beginning in the seventeenth century, several philosophers were critical of this approach, instead seeking to underscore the primacy of mathematical and logical proofs over empirical evidence. Bacon viewed the faculties of human reason combined with the instruments of the natural sciences (especially careful measurement, note-taking and organization) as the means by which one may develop hypotheses relating to the external world. His empiricism, therefore, is based upon a constant search for new knowledge and an emphasis upon the contingency of facts. The rationalists who came after him (and whose emergence typically marks the beginning of the Age of Enlightenment proper), by contrast, while also acknowledging the need for continuous scientific and philosophical enquiry, view the objectivity of truth as being distinct from our experience of the world and thus residing within the ideality of axioms and formulas.

Not all Enlightenment philosophers, though, sought to reject Bacon's empiricism in favour of such rationalism. In Great Britain, the dominant philosophical movement during the late seventeenth century and early eighteenth century came to be known as *British empiricism*, and followed a rather different trajectory to its continental contemporaries. If we argue (somewhat simplistically, but not entirely inaccurately) that Descartes, Spinoza and Leibniz constitute the three primary figures in the movement of continental rationalism, then we can say the same for John Locke (1632–1704), George Berkeley (1685–1753) and David Hume (1711–76) in that of British empiricism.

We can think of the differences between these two traditions through recourse to Descartes' problem of the evil demon (the earliest variation of what is now typically referred to as the 'brain in a vat' problem), in which it occurs to him that his senses can never be relied upon, since there is always the possibility that some evil being is controlling them. Whereas Descartes, who recognizes – following Bacon – with enormous foresight the potential power of mediation to alter our sensory experience of the world around us, fears that this distracts us from the eternal laws explicable through mathematics, the empiricists saw the mediation of sensory experience as the one thing that we *can* trust. Such experience, according to this account, is the basis of, rather than an impediment to, objective truth. Thus, Locke

argues, in sharp contrast to the rationalists, that the mind is a *tabula rasa* – a blank slate or tablet – and as such, contains no innate ideas. Everything that we come to know of the world and its laws is derived from our sensory experience. This is not to suggest that there are no such things as true ideas; rather, it means that these *ideas* are caused as the result of sensations, which in turn are produced by the *qualities* of things themselves. Importantly, Locke recognizes the way in which the senses mediate the data that they apprehend, noting that while some properties of things (shape, size, quantity, etc.) directly resemble the ideas that they produce in our mind, others (colour, smell, taste, etc.) do not.

Locke's argument, which was and still remains enormously influential, particularly in regard to psychology and the philosophy of consciousness, was extended and radicalized (taken to its absurd conclusion, one might say) by Berkeley, a British-Irish philosopher (and later Bishop) who distinguished himself from many of the other thinkers of the period by his devout and unabashed devotion to Christianity. Although all of the philosophers of the period made arguments for the existence of God, their portrayal of the highest power tended to be far more abstract and distant than in traditional Christian theology and tended to come, whether deliberately or not, with a certain level of implied scepticism regarding the authority of scripture. Berkeley effectively reverses Descartes' argument; it is inconceivable, he suggests, for a just, fair God to mislead his subjects and therefore, rather than doubting our senses, we can place our complete trust in them. The error, however, which he claims all prior philosophers have fallen into, is to assume that there must be something external to the senses:

> as it is impossible for me to see or feel anything without an actual sensation of that thing, so is it impossible for me to conceive in my thoughts any sensible thing or object distinct from the sensation or perception of it.
>
> (Berkeley 2003: 32)

Observing that one's experience of the world is entirely mediated by the senses, and that no thought of that world is possible outside of the senses, he comes to the troubling conclusion that there is nothing beyond the senses – that to *be* is to be perceived and nothing more.

In Berkeley's conceptualization of the universe, nothing exists other than minds and God. Most notably, there's no such thing as corporeal matter: the chair upon which we sit may seem solid, but that's only

because such solidity is a quality of the sensory data fed to us. It's not that God's attempting to trick us in some way – again, that would not be congruent with His nature – but simply that we as humans have consistently made the error of assuming that the things we perceive are more than merely the product of our senses. Berkeley thus views the universe effectively as one giant simulation – what was, a couple of decades ago, frequently referred to as 'virtual reality' – operated by a benevolent God for the benefit of His creations. A tree quite literally *does not* fall in a forest unless someone is there to see it.

The final British empiricist of note is Hume, a Scottish philosopher who built upon the theories of Locke (while largely spurning those of Berkeley) to develop a more nuanced, but also sceptical, understanding of the relationship between sensation and knowledge, the latter of which he viewed, once again, as being verifiable solely through experience. His argument that all of our ideas can only be derived from sensory data engendered within him a certain level of scepticism regarding our ability to judge truthfully what had previously been considered unproblematic laws. Most famously, Hume realizes that sensory data is not enough to prove the laws of cause and effect. When playing billiards, one may see one ball hit another, and the second ball move, but nothing can prove that those two events were connected, or that the same effect would happen if the action were to be repeated:

> When I see, for instance, a billiard ball moving in a straight line towards another; even suppose motion in the second ball should by accident be suggested to me, as the result of their contact or impulse, may I not conceive, that a hundred different events might as well follow from the cause? May not both these balls remain at absolute rest? May not the first ball return in a straight line, or leap off from the second in any line or direction? All these suppositions are consistent and conceivable. Why then should we give the preference to one, which is no more consistent or conceivable than the rest? All our reasonings a priori will never be able to show us any foundation for this preference.
>
> (Hume 2011: 595–6)

His argument is not that there is no causal force that leads to the movement of the billiard balls, but simply that inductive reasoning is not sufficient to actually prove the existence of this force; what it can do, however, is establish causal connections between events in time, thus allowing us to make tentative (but never absolute) inferences regarding cause and effect.

If the continental rationalists, with their emphasis upon *a priori* reasoning, eternal laws and mathematical deduction, can be viewed as following a primarily Galilean line of thought, then the British empiricists, who emphasize *a posteriori* reasoning and empirical induction can likewise be seen as taking a somewhat divergent, Newtonian path. Isaac Newton (1642–1727), an English scientist whose work revolutionized not only physics, but natural philosophy as a whole through its positing of the three famed laws of motion and the theory of gravity, was – in spite of his aforementioned contributions to mathematics, including possibly the discovery of calculus – an ardent empiricist, who was in correspondence with Locke, among many others. Although mathematics was crucial to the development and explication of his theories, Newton largely rejected the deductive reasoning of the rationalists, by which general laws would be posited and then tested through reference to empirical observation; instead, he sought to use observation and experimentation as the very basis of scientific enquiry, from which general laws would be induced.

Although they tended to reject scientific inquiries premised upon these theoretical hypotheses, the rationalists did not at all reject the notion of universal laws (although Hume was sceptical of our ability to ever demonstrate them adequately). In fact, Newton is largely responsible, as we shall see in Chapter 5, for instilling an image of the universe not as a domain ruled by divine fiat, but as a well-tuned machine, operating according to the infallible rules of natural law. Ironically, however, Newton (who was a very committed, albeit heterodox Christian) was opposed to such an understanding, emphasizing the role of God in establishing and maintaining such laws. What the rationalists and empiricists both share, for the most part, is a commitment to a view of the world as ordered, logical and rationally conceivable, and in most cases (Hume being the notable exception here, given his far more thoroughgoing scepticism), with God positioned as a universal mediator: the being through whom the various parts of the universe cohere into a stable, rational and objective whole.

The encyclopaedia, one of the most iconic media developments of the Age of Enlightenment, reflects this belief in its attempt to catalogue all the world's objects and phenomena within a strict, schematized structure. Even though it never came even remotely close to achieving its goal, the very notion of the encyclopaedia in its original guise reflects what we might describe as the arrogance or vanity of philosophy (including the natural sciences) at this time, believing that it was

sufficient for describing and understanding, in interlocked terms, all beings within the world – everything was perceived as up for grabs by philosophy. More generally though, this universalism is reflected in the sheer breadth of material covered and research performed by the philosophers of the period. Locke's key work, for instance, *An Essay Concerning Human Understanding*, deals with psychology, epistemology metaphysics, language, mathematics, religion, natural science and morality, among other topics. In other texts, he also wrote extensively on politics, economics and Biblical exegesis.

Once again we witness here the impact of print and its popularization of the book-form as a specific physical ordering of knowledge. Although the manuscript culture of the mediaeval scholastics relied heavily upon the storage medium of the codex (a bound collection of handwritten pages), the sheer scarcity of these volumes (given that each one needed to be copied by hand) meant that they would always remain supplements to spoken disputation. As Heim (1993: 34) writes in regard to Saint Thomas Aquinas, the most prominent philosopher of this period:

> The system in Aquinas's writings is subordinate to other concerns. In his *Summa*, he poses and answers questions; he cites and interprets ancient texts; he recounts at length opposing views and argues with them; and he raises objections to his own views. In short, Aquinas creates a dialogue with his culture, not a closed system. In this way, the book format of the *Summa* is incidental. The bound volumes are collections. They channel a continuing discussion, and they reproduce the style of an oral dissertation or a spoken defense. So the dominant format for philosophical thinking was not always the book.

With the arrival of the printing press in Europe, the dissemination of philosophy was no longer reliant upon speech – books could be affordably published and widely distributed on an unprecedented scale. The result is the encyclopaedic vision of philosophy, each philosopher striving to produce a complete, totalizing system that can describe and explain all aspects of human existence.

In all of the cases noted above, we see a shared belief in an objective truth that does not just belong to the subjective realm of individual experience, even if it might be obtained through it. Although their approaches and demands may vary, all of these philosophers, even Hume, remain tied to a correspondence theory of truth that presumes the possibility of statements accurately describing such a truth. What

distinguishes these philosophers (Bacon onwards) from the scholastics who preceded them, though, is a renewed focus upon the *methods* by which such a truth may be acquired and verified. No longer is it taken as adequate the assumption that truth is already inscribed and merely in need of interpretation; on the contrary, philosophy begins to involve itself in the *measurement* and *calculation* of truth. As Maurice Blanchot (1993: 3–4) writes, beginning with Descartes

> form is no longer that of a simple exposition (as in scholastic philosophy), but rather describes the very movement of a research that joins thought and existence in a fundamental experience: this being the search for a mode of progressing, that is, a method; this method being the bearing, the mode of holding oneself and of advancing of one who questions.

At the same time though, it is taken as given by such philosophers that these methods are still merely instruments of acquiring a truth that exists prior to them; the objectivity of truth, to put it another way, is presupposed as ontologically distinct from the conditions that allow us to access it.

When we investigate the media today, and the way in which they report events, it is quite tempting to think about the issues that this topic brings up in the terms of correspondence. To what extent, we might ask, are journalists able to describe what they're reporting in an accurate and unbiased manner? In doing so, however, we make an assumption which is not necessarily justified: we assume that truth can be measured in relation to a possible, *unmediated* correspondence between a statement and the external reality that it claims to represent. What if this is not actually possible though? What if the very notion of truth *requires* mediation? It is these questions that came to challenge the overarching dogma of Enlightenment thought over the course of the eighteenth and nineteenth centuries.

Kant and transcendental idealism

Immanuel Kant was a German philosopher whose work would come to define eighteenth-century philosophy, albeit not in the way in which he necessarily intended. Kant viewed himself as having solved the problems that he felt plagued the Age of Enlightenment, in particular the tendency of critical reason to destabilize traditional values such as the possibility of a rational belief in God. Kant's philosophy is notoriously difficult, both conceptually and in terms of presentation, and it

is thus impossible for us to discuss it with the detail required to do him justice. Nonetheless, some explanation is necessary in order to understand this distinct shift away from Enlightenment philosophy in the eighteenth and nineteenth centuries. For while Kant rarely speaks on media in the way in which we might normally think of the term, it is in his work that the question of mediation first properly enters philosophy, and this in turn has shaped the various ways that we view the effects of media even in our present age.

At the time that Kant was writing, the most influential philosopher in Germany was Christian Wolff. A gifted polymath, Wolff composed long, systematic treatises in both German and Latin on almost every imaginable subject in philosophy, both natural and theoretical, theology and psychology, and in doing so, provided German speakers with the first substantial body of philosophical work written in their own vernacular. As with Descartes, whose *Discourse on the Method* was written in French (albeit published in the more liberal Netherlands in order to avoid censure), and the British empiricists, who wrote primarily in English, Wolff reflected the gradual emergence of national identity within philosophy – in large part a result of the popularization of the printing press in the fifteenth century, which allowed the affordable production of texts in various languages – in contrast to the mediaeval scholastics who wrote exclusively in Latin. Wolff wasn't an overly original thinker; his approach lay essentially in methodizing the short, disjointed essays of Leibniz, creating a unified, systematic doctrine of Leibnizian philosophy. Focused upon the law of noncontradiction, which states that two directly contradictory statements cannot both be true simultaneously, he sought to turn this law into a general principle from which all other metaphysical maxims can be derived. For Wolff, it seemed plausible that an entire metaphysical system could be derived entirely from evaluating the truth of statements in relation to the law of noncontradiction – after all, metaphysics by its very nature did not need to be validated through experience.

Kant began his career influenced a great deal by Wolff; over time, however, he came to question whether such an approach was truly plausible. In particular, he credits Hume for waking him from his 'dogmatic slumber' (Kant 2004: 10). Kant became convinced that the logical result of Hume's philosophy was not an absolute scepticism but rather an understanding of a new type of logical proposition which could demonstrate cause and effect without relying upon sensory experience. He identified two kinds of statements that operate in this fashion,

the first being mathematics and the second metaphysics, and clearly delimited the boundaries of their study. 'If one wishes to present a body of cognition as *science*,' Kant (2004: 15) argues, 'then one must first be able to determine precisely the differentia it has in common with no other science, and which is therefore its *distinguishing feature*'. At a time when science was becoming increasingly universal in its ambitions, and seemingly able to offer all of the answers, Kant sought to defend his discipline by attempting to clearly distinguish metaphysics as its own discrete science.

The result was that, according to this account, topics once considered at home within such a field of study – questions relating to the beginning of the world, the characteristics of God or the possibly everlasting nature of the soul – came to be proscribed as *transcendent*, and thus unable to be adequately determined through metaphysical enquiry. Metaphysics was confined to a single object of study: the conditions and limits of experience. The result of this understanding was the development of what Kant termed *transcendental idealism*: a theory that sought the conditions of possible experience. Rather than assuming that in order to know something about the world our knowledge must conform to the objects external to us, and thus seeking to understand what the nature of the mind must be in order to know, Kant begins instead with the premise that these objects must conform to *our* knowledge, and thus seeks to find out what the nature of objects must be in order for us to know them.

Transcendental philosophy in the Kantian mould begins with the premise that 'objects in themselves are not known to us at all' (1998: 162). This does not mean that we know nothing about the things that reside outside of our mind; rather, it means that we know nothing about these things prior to our knowledge of them. We can only know them as they appear to us, through our sensory organs and processed by our mind. This may seem obvious now (although it is still disputed by many), but at the time it was genuinely revolutionary. Previous philosophers may have accepted that humans could never gain absolute knowledge of the world (e.g. Plato seems quite hesitant to believe that we have the capacity to know the forms in their own right), but this was only a matter of degree: these philosophers still speak of absolute knowledge as if it were something that may be attainable, even if humans' minds are too feeble to do so. They subscribe, in other words, to the unproblematic identity of truth and correspondence. For instance, Augustine, the scholastics and the Enlightenment

rationalists are all able to conceive of an all-knowing God, whose ability for knowledge is basically the same as that of humans, only infinite rather than finite.

Kant does something quite different. His conception of metaphysics recognizes that the limits of human knowledge form, from the perspective of the mind, the absolute impenetrable horizon of the world. When we speak of things external to us, we are in fact only making reference to appearances within our mind. It is for this reason that we state that Kant was the first philosopher to incorporate the process of mediation as a fundamental component of his philosophy. Challenging the correspondence theory of truth, Kant instead proposes an early form of what has come to be known as the *coherence theory of truth*. Whereas in the former case it is presumed that there is a distinction between truths and the conditions of their access (i.e. the belief that they are true), in the latter truth is taken as one and the same with its conditions and, as such, truth becomes a set of justified beliefs.

In highly simplified terms, our experience of the world is, for Kant, always premised upon a synthesis or mediation of *sensibility, intuition* and *understanding*. Sensibility refers to the means by which the mind gains knowledge of things (what we might otherwise call 'perception'). What is confusing, however, is that we do not simply passively receive this data – sensation exists prior to knowledge and, hence, we cannot actually know anything about it, although it shapes our experience of the world, and therefore is reliant upon another process known as *intuition*, which is premised upon the forms of *time* and *space*. Contrary to common wisdom, Kant argues that neither of these categories exists in the things in themselves; rather, they are an *a priori* product of our intuition. If 'we remove our own subject or even only the subjective constitution senses in general,' he argues, 'then all the constitution, all relations of objects in space and time, indeed space and time themselves would disappear, and as appearances they cannot exist in themselves, but only in us' (Kant 1998: 168). We cannot know things in themselves because we cannot know things without first intuiting them through the forms of space and time, and then subsuming them under concepts furnished by the understanding.

This basic principle, whereby experience is not merely something that we gather from the external world, but is the synthesis of such sense data with pre-existing categories, thus foreclosing the possibility of actually having knowledge of that initial data, persists throughout

much philosophy to the present day and influences even our most non-technical discussions of the media. When we ask whether it is possible for the news media to provide objective coverage of events, to take just one example, we are still debating the questions that Kant first posed – not simply whether we have objective knowledge at present, but whether such knowledge is possible *at all*. It was Kant who first developed a systematic philosophy that took mediation into consideration when theorizing the possibility of truth and knowledge. The mediation that occurs first between our sensory organs and our faculty of intuition and then second between our faculties of intuition and understanding – as mediated in the second case by the faculty of imagination – ensures that we can *never* speak of a world that has not been affected by these processes.

Kant perceives of the human mind not as a passive receptacle for sensory data, but as an active processor of this data: in order to be understood, data must have both the spatio-temporal forms and the transcendental categories projected upon it by the mind. This is a recognition that *mediation matters*, that knowledge is produced rather than merely received. No longer in his estimation can we speak of *proving* the existence of God, the immortal soul, or an eternal universe, for the answers to such questions reside only within the unreachable mysteries of the thing in itself. To believe in such things, therefore, we must rely upon faith. More than this, however, the possibility that Kant offers is that of a world radically different to the way in which we perceive it – an unthinkable realm that can only be grasped through the projection of space and time upon it, making it palatable to our mind. From this conception, it is only a short distance to the ways in which we speak of media today. It is common to argue, for example, that all of our experience must in some way be mediated through the lens of language and discourse – not only that we literally cannot speak of our experience without recourse to language, but that we cannot even think it. This is fundamentally Kantian in the way that it establishes an absolute horizon of knowledge, necessitated by the mediating effects of language, that we cannot possibly cross.

In his earlier work (*The Order of Things* (1970) and *The Archaeology of Knowledge* (1972) in particular – arguably his two most difficult texts), Michel Foucault often writes with overtly Kantian language, referring to a 'historical *a priori*' that establishes the terms and limits of discourse within a specific era. Likewise, when we speak of the way in which technologies mediate our experience of the world – for

instance, McLuhan's argument that the shifts from orality to literacy, literacy to print, and then print to electricity, fundamentally alter our sensory perception – we are once again following the line of enquiry first set by Kant, albeit one in which the synthesis occurs primarily in a realm *external* to the human mind. We do the same when we speak about the way in which various technologies – from the sundial to the clock to industrial machinery and now computers – have altered our sense of time. This is perhaps the key element missing from Kant's philosophy. Rather than simply assuming that ideas such as space and time, cause and effect, etc. are natural and necessary components of human consciousness, these later theorists have demonstrated the role of external media in enabling these forms of thought.

Perspectivism and postmodernism

When we begin to question the role of objectivity in media practices, however, the conclusion that we come to is often one even more radical. Rather than merely suggesting that truth is accessible to humans only through the mediation of our own thought, it is easy to wonder whether 'truth' – in any meaningful sense of the word – does not actually exist in the manner that we have typically believed. After all, if the world that we as individuals experience is always the result of this filtering process, then why would we assume that we can ever speak of a stable external reality? This is not necessarily a new problem. Hume in fact already touched upon it when he presented certain laws, such as those of causality, as contingent assumptions produced through principles of association in our mind, rather than directly demonstrable truths. But Hume never really took this further, largely remaining faithful to the image of a stable, rational universe. It was only with the German philosopher Friedrich Nietzsche, who mounted one of the single most potent critiques of Western rationality ever conceived, that such notions of objectivity were really called into question.

Taking the notion of a coherence theory of truth, in which truth becomes a matter of belief rather than a question of correspondence to a pre-existing external object – as in Kant, for whom truth becomes a matter of coherence to structures of thought – to its logical extreme, Nietzsche (1997: 87) calls into question the very notion of an objective reality, arguing instead that:

> [t]here is only a perspectival seeing, only a perspectival 'knowing'; the more affects we are able to put into words about a thing, the more eyes,

> various eyes we are able to use for the same thing, the more complete will be our 'concept' of the thing, our 'objectivity'.

His use of scare quotes here is not merely incidental, for he is not just suggesting a new mode of 'knowing' or 'objective' thought; rather, he is indicating the *impossibility* of these concepts, at least as absolute values. Put simply, although one can combine various interpretations and perspectives on an object or event in order to form what would seem to be a more complete picture of it, one will never reach a stage where this picture is actually complete. To make such a claim would rely upon the presumption of an objective, external world (Kant's thing in itself) *prior to* these perspectives. Instead, for Nietzsche (1967: 267), '[i]n so far as the word "knowledge" has any meaning, the world is knowable; but it is interpretable otherwise, it has no meaning behind it, but countless meanings'.

Distinct from the solipsistic sophists of antiquity, who argued that knowledge is an impossibility, Nietzsche does not really question the possibility of knowing; instead, he posits knowledge as an effect of what he terms the *will to power*, such that it does not refer to a pre-existing external object so much as it *produces* new objects. This is a quite radical challenge to philosophical orthodoxy, which has traditionally prided itself on having access to the truths of the world that are shielded from view in our everyday experience, and although he doesn't describe it in these terms, one might propose that what Nietzsche is expressing here is the *absolute primacy of mediation*, to the extent that the world itself (insofar as we can know it) is nothing other than the process of interpretation. From such a viewpoint, the anxieties that we express when wondering whether the news media are suitably 'objective' fade away, replaced by a sense that such concerns no longer matter – that all such reporting does not so much refer to events as produce them, in a historically, politically and socially situated and contingent manner. Of course, the producers of news itself are unlikely to admit as much, for they still rely upon 'objectivity' as a journalistic value against which the quality of their coverage might be measured.

Although Nietzsche was writing more than 100 years ago, it was only really in the second half of the twentieth century that his suggestion that 'the conditions of life might include error' (2001: 117) – in other words, that there might not be a single, unified truth to which philosophers can appeal; that knowledge might be intrinsically fragmented and scattered – came to be taken seriously. For instance, in his

posthumously published *Philosophical Investigations* (2009), the brilliant but gnomic German philosopher Ludwig Wittgenstein challenges what he sees as typically and narrowly essentialist conceptions of language within philosophy, which seek to explain in universal terms what language is, by presuming that it is composed primarily of words and the meanings to which those words refer. Conversely, Wittgenstein proposes that language is much broader than we usually think of it, and needs to be understood in terms of the *ways in which it is used*, for it is through this usage that its meaning emerges. Wittgenstein (2009: 15) describes the numerous varied ways that different people and communities use language as 'language-games', in order to 'emphasize the fact that the *speaking* of language is part of an activity, or of a form of life'.

The importance of Wittgenstein's argument here is that he launches a challenge to the conventional understanding of language as deriving meaning from its external referents; instead, language would seem to create reality as much as describe it. Such a notion would find a great deal of currency within the stream of French thought that is commonly referred to as *postmodernism* or *poststructuralism*. Foucault (1984: 95) builds upon Nietzsche's thought in order to argue that 'all knowledge rests upon injustice (that there is no right, not even in the act of knowing, to truth or a foundation for truth)', such that this knowledge is as much destructive as it is illuminative, gradually shattering the very image of universal truth towards which it strives. Derrida (1997: 49) likewise argues that the *death of God*, to which Nietzsche famously refers in several of his later works, means the end of 'the transcendental signified, which, at one time or another, would place a reassuring end to the reference from sign to sign'. Put simply, Derrida suggests that the dominance of logocentrism within Western metaphysics (as we discussed in Chapter 1) is founded upon an irrepressible desire for an external object against which all truth can finally be measured. In most cases, it was God who fulfilled this role; however, Derrida argues that in our present time we have lost such certainty and find ourselves no longer able to appeal to this kind of eternal source of absolute truth.

Finally, Jean-François Lyotard, in his influential and (at one point) contentious book *The Postmodern Condition: A Report on Knowledge* (1984), draws upon Wittgenstein's aforementioned concepts in order to argue that 'language games are the minimum relation required for society to exist'. Defining the postmodern in terms of its scepticism towards what he terms 'metanarratives' – those metaphysical attempts to narrate already existing narratives of history in order to describe

a teleological goal to which they supposedly lead (the Enlightenment principle of progress is probably the best known example of this, along with the Marxist belief in a utopian society towards which society is supposedly driven) – Lyotard declares the need to abandon the model (exemplified by the work of Jürgen Habermas) of consensus as an emancipatory force, and to instead embrace a vision of society that accepts the multifarious and incommensurable language games that allow different groups to narrate the world and their own lives in distinct ways. This is, for him, a way of resisting the potentially deleterious effects of the increasingly scientific and computerized forms of knowledge that he sees as dominant in the postmodern era, which place an emphasis on the production of knowledge rather than the ends to which that knowledge aspires.

In all of these cases, we witness a direct challenge to the assumption that there is an objective truth of which we can unproblematically speak. Although surely none of these thinkers would actually challenge the existence of an objective reality, what they do attempt to problematize is the notion that language or discourse is adequate to represent this reality. In other words, they propose the primacy of *mediation* over objectivity – following the basic schema laid down by Kant, our experience of the world is inextricably mediated by systems over which we don't really have any control. For a long time, this relativism was posited as an exciting and liberating discovery, which had the possibility of breaking down ossified social norms and practices – we might look at, for instance, Butler's (1990: 139) call for a kind of gender performance that can 'enact and reveal the performativity of gender itself in a way that destabilizes the naturalized categories of identity and desire'. Within the study of media specifically, it has long been commonplace to use methods such as semiotics and discourse analysis in order to illustrate the indeterminacy of texts and to underscore the ways in which such media are both subject to a wide range of divergent readings and contribute to the mediation of our experience.

At the same time, though, we might wonder – as this postmodern relativism finds itself more and more normalized within everyday discourse – to what extent these positive effects have actually occurred. There is no doubt that over the past few decades certain markers of social identity (especially in relation to gender and sexuality) have loosened considerably, and this is undoubtedly a valuable change from the perspective of inclusiveness and social justice. Unfortunately, a noxious

scepticism has also permeated other aspects of social and political discourse – as Jodi Dean (2009: 95) observes:

> the convergences of neoliberalism and democracy, the materialization of democratic ideals in the information and communication technologies that support and extend global corporate capitalism, establish a matrix wherein each is entitled to her own opinion and incited to protect that precious opinion by voicing it as loudly and resolutely as possible.

We see such concerns play out in the mainstream press, which in many cases has been disturbingly willing to challenge the scientific consensus regarding climate change (and concomitantly, the authority of these scientists to make such claims in the first place) in the name of so-called 'objectivity', as if it is the responsibility of journalists to present an alternative perspective to an overwhelming unanimous proposition by the scientific establishment. We see it also in the rise of blogging and social media, which introduces an unprecedented plurality of voices into a media landscape once dominated by a few major players, but does so at the expense of any ability to effectively curate the opinions on offer or test their veracity. We will explore this topic more in later chapters, but it is worth noting now the ways in which the normative model of the public sphere has been challenged by an atmosphere of radical individualism and epistemic relativism.

5 Automata and the metaphor of the machine

Philosophers draw upon metaphors from technology and media in order to ground and illustrate their often quite abstract theories. We have surely always thought of ourselves in analogical terms to our technics – as Kittler (2010: 35) puts it, 'the only thing that can be known about the soul or the human are the technical gadgets with which they have been historically measured at any given time'. We saw this in Chapter 3 when we examined the shift from the mechanical and mathematical images of much ancient thought, through the Book of Nature that the mediaeval scholastics sought to interpret, to the rational calculations and clockwork efficiency of the continental rationalists. This legacy has had a profound effect not only on subsequent philosophical thought, but on technological development right through to the present day.

We are currently living in a time when the human body and mind, rather than being perceived as an inherently superior being (as was commonly believed throughout much of Western thought, and is reflected in philosophy's quite consistent scepticism regarding new technologies, which it tends to view as an alienating supplement of humanity's innate capabilities), is instead quite commonly conceived of as a mere machine and one that might be rapidly obsolescing. We have the study of genetics and its mapping of heredity and variation in the human species through discrete codes, cognitive science, which seeks to understand the mind in terms of informational structures and computational procedures, as well as constant research into the possibility of artificial intelligence, which might actually replicate functions that were previously seen as inherently and inextricably human. Even as far back as the seventeenth century we see the development of mechanical computers as a means of replacing the work of humans to increase efficiency and minimize error – presaging the great industrial machinery of the nineteenth century, which would demonstrate

how comparatively unproductive men and women were in relation to mechanical automation.

It would be misguided to dismiss any of these developments as being inherently inimical to human development – in most cases, they are precisely the opposite – and to retreat back into an essentialist vision of the human being. To do so would actually occlude the role of media and technology in shaping our vision of the world and ignore the ways in which they have always done so. At the same time, though, it is important to recognize that the image of the human as a machine has developed out of a quite specific lineage of thought and reflects the mutual intertwining of media and philosophy since Greek antiquity.

Continental rationalism and the automaton

Although we have witnessed how Anaxagoras compared the universe to a machine set in motion, and Plato conceived of the soul at times as a kind of eternal wax tablet, with the truths of the universe always already inscribed upon it (at other times, his preferred metaphor was that of the city-state – in fact, the entirety of *The Republic*, while superficially appearing to be a political treatise, may be read as a complex analogy for the betterment of the soul), for the most part, the philosophers of antiquity tended to define the soul in terms of its immateriality and immortality. In other words, the soul was posited as that which resisted, by its very nature, the vulgarity and transience of everyday life. This conception of the soul hewed well with early Christian theology, which also underscored the immortal soul (holding open the possibility of punishment or reward in the afterlife). Saint Augustine, the first notable Christian philosopher, was himself a Platonist and quite happily perpetuates Plato's disdain for the material world.

During the seventeenth century, however, in light of the vast advances in scientific thought and technical invention, philosophers began to view the nature of humanity in very different terms to their mediaeval forebears. This is most clearly seen in Descartes (1998: 169), who asks us to imagine a machine that looks and acts as a human in every way, suggesting that we 'should consider that these functions follow in this machine simply from the disposition of the organs as wholly naturally as the movements of a clock or other automaton follow from the disposition of its counterweights and wheels' and, as such, it isn't necessary 'to conceive of any vegetative or sensitive soul, or any other principle of movement or life, other than its blood

and its spirits'. Similar sentiments are expressed by Descartes' English colleague and interlocutor Thomas Hobbes (2010: 9), who actually opens his famed *Leviathan* by asking 'why may we not say, that all *Automata* (Engines that move themselves by springs and wheeles as doth a watch) have an artificiall [*sic*] life?', once again suggesting that the operations of the human body and the machine are not necessarily all that different. How would we consider the heart, Hobbes rhetorically questions, as anything other than a spring, or the nerves as springs and joints as wheels, all giving motion to the human body?

Hobbes makes this argument with a particular purpose – to emphasize that a state or commonwealth is in some sense an artificial person (i.e. a machine), composed of many individual humans working in unison. Simultaneously, though, the very fact that he is willing to concede such similarities is reflective of how much things had changed in a rather short period of time. Perhaps most important is the notion of artificial life that he hesitantly proposes, for this immediately calls into question the then common wisdom that life is something God-given and that the human being in particular is reliant upon a soul that exceeds the constraints of the material world within which it finds itself temporarily trapped. Similarly, at this same time of unprecedented technical invention and scientific discovery, Descartes is able to conceive of a machine, crafted by human hands, that could in its outward appearance mimic their creator in every way. Although he never goes quite as far as to suggest that the human being is itself a machine, Descartes is definitely willing to admit that a machine could hypothetically be built which, to an external observer, would be indistinguishable from the human being.

Descartes believed that he was able to imagine himself thinking without any material existence. From this argument he derives a dualistic understanding of the universe, which he sees as consisting of two utterly distinct realms – thought and extension (i.e. space). By conceiving of the world in such a fashion, he is then able to justify his emphasis upon mathematics and geometry as the domains of truth, for the substance of thought is also the domain of God and hence the substance within which truth resides. Mathematics is the means by which the mind is able to think without the distractions of the material world. Of course, the fact that the mind *can* be distracted by it indicates that these realms can't be *entirely* separate. Descartes needed to explain how the actions of the body, which belongs to the realm of extension, could be controlled by the mind and, likewise, how the mind's thoughts

could be influenced by the sensations of the body. His solution, which has become fairly notorious for its inadequacy and contrivance, posits the pineal gland – a tiny endocrine gland located close to the centre of the brain – as an interface mediating between the two substances.

Such an argument was obviously lacking in explanatory value, so it was rejected by Descartes' adherents, who substituted rather more fanciful, theologically tinged explanations for his attempt at naturalism. Nicholas Malebranche, for example, suggested that it was God who acted as the mediator between these material and immaterial realms, actively intervening on every specific occasion so as to make it seem that there are interactions between them (1997). Spinoza argued that thought and extension were not substances in their own right, but instead were both parallel attributes of a single substance and thus were connected in perfectly parallel chains of causality. Similar to Malebranche, Leibniz argued that God established a perfect harmony between all beings at the moment of creation, so that at all times they appear to be interacting, even though it is not actually the case. As strange as all of these explanations are, it is worth noting that this dualistic distinction between immaterial thought and the material body is still a surprisingly common trope within contemporary theorizations of media and communications.

Just as resilient has been Descartes' conception of the human body as analogous to a machine, which found sustained popularity among his rationalist successors and survives in some form through our present computing technologies, which were developed in large part upon this very same principle. Digital computing has a long history – perhaps longer than most people realize. It was in 1642 that the philosopher, mathematician and later theologian Blaise Pascal – probably most notorious for his formulation of what we typically refer to as 'Pascal's wager', his much disputed justification for a belief in God – produced the first mechanical computer (although Wilhelm Schickard is believed to have drafted plans for a similar device even earlier). Inspired by a desire to reduce his father's workload as a tax commissioner, Pascal not only designed but also built and patented his device and managed to sell several subsequent versions of it to interested parties. While simple by today's standards (as well as being far too expensive and complex to ever become a truly marketable commodity), it was – through the use of rotary dials – successfully able to automatically add and subtract numbers.

Although not frequently discussed, Pascal's calculator marks a crucial moment in the history of media. Specifically, it is the point at which arithmetic became no longer a mere mental activity (usually assisted through various forms of external retention, such as counting on one's fingers – which is where we get the very term 'digital'; using counters or abacuses to tally objects; or handwritten mathematical notation), but was instead thoroughly exteriorized and automatized. Even after his conversion to orthodox Christianity, and subsequent turn towards more theological lines of enquiry, Pascal (1995: 12, 136) remained convinced of the value of mathematics, arguing in his *Pensées* that it is humanity's purpose to 'seek God through reason', suggesting that 'the adding machine produces effects which are closer to thought than anything done by animals', viewing the distinction between this machine and the human as lying primarily in the former's lack of an independent will.

In terms of the development of digital media, however, even Pascal pales in comparison to the influence of Leibniz, who, as we have already seen, is more than any other philosopher responsible not only for the idea that knowledge can be most effectively expressed in a digital form, but for offering practical applications of this idea, most notably through his development of the Stepped Reckoner, another early digital computer first completed in 1692 – the invention of which was inspired by a desire to improve upon Pascal's device. Operating through a series of stepped drums – essentially gears with teeth of varied lengths – Leibniz's calculating machine automatized all four basic arithmetical operations and its design formed the basis of most subsequent digital computers until the mid twentieth century (when electronic versions started to obsolesce their mechanical predecessors), including the Arithmometer, a French calculator that was successfully commercialized in the second half of the nineteenth century, and the Curta, a portable and relatively affordable calculator developed in 1948.

They would not come into widespread usage until the nineteenth century, but these early mechanical calculators augur the development of digital computation as a whole over the next 400 years. Francis Bacon's call for a mode of scientific enquiry anchored to the sureties of the machine finds its (at least partial) fulfilment not merely in the notebooks and fixed rules which he envisaged, but in the gradually realized promise of a device which would entirely exteriorize all necessary calculations, thus seemingly removing the impediments upon the capacities of the human intellect. Although the practical instantiation

of such a shift was still centuries off in Leibniz's time, the dream of computation as a way of divesting humanity of its mental limitations is expressed quite clearly in his philosophy, particularly in the twin concepts of the *characteristica universalis* and the *calculus ratiocinator*, which together epitomize the rationalist search for a universal system of knowledge. Both of these ideas – the first referring to a hypothetical universal language through which all thought (primarily scientific and metaphysical) could be expressed, and the latter to a computational algorithm that could determine whether a statement formulated in the symbols of the *characteristica universalis* was true or false – reflect a growing emphasis upon the means of calculation *as ends in themselves*.

For Leibniz, it seemed clear that all the truths of the universe could be represented through a symbolic language based in large part upon mathematics and formal logic. The difficulty with this, however, is that the greater the knowledge that is accumulated, the more calculations that are needed in order to represent it in a reasonable manner. As such, it became increasingly apparent that the combination of the human mind and hand were no longer sufficient for such practices of encoding, processing and storage – a greater mechanization was needed. This is, we must remember, the age of the printing press, in which mechanical reproduction had allowed for an accuracy in transmission previously unknown in the time of the scriptoria, when copyists worked from dictation. The printing press offered an image of communication unsullied by the mortal hand and its inaccuracies. Whence the mechanical computer.

It is significant that, in addition to the founder of continental rationalism, both Pascal and Leibniz – the two men largely responsible for this early development of digital computing – also shared a belief in the essentially mechanical nature of living things. Leibniz had the most radical take on the subject, however. His belief in a pre-existing harmony among all beings, ensuring the appearance of causal interaction between matter and substance, was expressed in quite literally mechanistic terms. We must remember that Leibniz's age was characterized not only by the development of the calculating machine but, perhaps even more importantly, the pendulum clock. Invented in 1656 by Christiaan Huygens, a Dutch inventor and scientist who had corresponded with both Descartes and Spinoza (and who had a long-running dispute with Newton over whether light was best represented as waves or particles), the pendulum clock offered an unprecedented precision in timekeeping, allowing its users to accurately measure discrete units of

time. Through the combination of soul and matter, Leibniz argues, there is a unity that could not occur in either the machines humans create or the inert matter of nature. This unity is 'like a watch composed of springs and wheels' (2006: 73). Making explicit reference to Huygens and his discovery of a natural synchronization between pendulums, Leibniz (2006: 77) suggests that the universe is directed by 'an anticipatory divine artifice' – that is, each individual is effectively a mechanical watch which is wound up at the beginning of time with such care and precision, in perfect synchronization with all other beings, such that it would never lose time.

Leibniz's philosophy, then, occurs at the beginning of a profound technological transition, in which *clock time* – that is, a mode of existence in which human relationships are structured, regulated and synchronized on the basis of the mechanical clock – becomes the predominant means of social organization. Although time measurement itself was not new, whereas once it was practised on the basis of environmental change (e.g. the movement of the sun, the seasons, etc.), with the apparent perfection of the mechanical clock it became a wholly abstract mode of technical thought. Under the aegis of this clock time, the orderly routines once demanded only of monks in mediaeval monasteries became the new norm – a means of disciplining workers, whose previously task-oriented work routines were transformed into uniform working days, with quite specific and often highly demanding expectations in regard to how long and how intensely they had to work. Around this time also, which marks the earliest moments of what would eventually become the industrial revolution, Adam Smith (1723–90), one of the key philosophers of the so-called Scottish Enlightenment, wrote *The Wealth of Nations*, the first book to systematically explore the topic of political economy and probably the most important single text in the development of early modern capitalism. By laying down principles that he believed would maximize the profit and efficiency of a nation's production, Smith seemingly demonstrated the necessity of more tightly and determinedly regulating the economy along scientific and technical principles. 'The principle of self-regulation repeating by reverberation from the Newtonian sphere swiftly entered all the social spheres' (McLuhan 1962: 270).

Clock time appeared to form the perfect complement to the scientific advances of the age. As with Newton's inductive method, with which he would move from empirical observation to the refinement of general laws, typically expressed mathematically (as in his key text,

the *Philosophiæ Naturalis Principia Mathematica*) and Galileo's similar moves in regard to the relationship between science and geometry, particularly his heliocentric model of the universe, which implied that the universe itself was in some way a clockwork machine, what the mechanical clock seemed to offer was a more precise measurement of the empirical phenomenon of time. Of course, what was not adequately recognized in such an assumption is the fact that the clock does not merely measure time; rather, it is a medium that produces a particular understanding of time – one that would saturate everyday experience until the late twentieth century. 'As a piece of technology,' argues McLuhan (1964: 158), 'the clock is a machine that produces uniform seconds, minutes and hours on an assembly-line pattern', such that 'time is separated from the rhythms of human experience'.

When we think about the remarkable technologies that were being invented in his time, including those he developed himself, we can understand why Leibniz (2005: 58, 61) would describe the body of a living being as 'a kind of divine machine or natural automaton' and in turn argue that God is to his creations 'what an inventor is to his machine'. By conceptualizing the world in terms reducible to mathematically formulable laws, it makes sense that he would thus view humans as automata within a vast machinic apparatus designed by God. This isn't to say, however, that Leibniz, or any of the other philosophers mentioned so far, are actually willing to concede that the human being is *the same* as a machine. Descartes (2003a: 42) was most stringent in this regard, arguing that the automaton is more accurately compared to (non-human) animals, in that the latter 'have no intelligence at all', and thus that:

> it is nature which acts in them in accordance with the disposition of their organs, just as we see that a clock, which is made only of wheels and springs, can count the hours and measure time more accurately than we can with all our efforts.

But all of these philosophers are, by virtue of their belief in some form of separation between thought and matter, hesitant to ascribe to the human the very same characteristics as those of the mechanical device.

'The automaton', writes Jean Baudrillard (1983: 93), 'has no other destiny than to be ceaselessly compared to living man', not so as to posit it as directly equivalent to the human, but rather, to emphasize its

inferiority in spite of these superficial similarities. Thus for Descartes (2003b: 25) human beings are distinguished by their free will, which is only enabled by the presence of 'the soul by which I am what I am', and likewise for Pascal (1995: 148), whose argument that we 'are as much automaton as mind' highlights the distinction between the body as mechanized automaton and the mind as the autonomous will which controls it. Malebranche (1997: 98) follows the same line again, suggesting that bodies without souls 'are nothing but pure machines', and that the soul is so utterly incompatible with the machine of the body that it is only through the direct intervention of God in every occasion that a causal link between them is able to be established. Even Leibniz (2005: 58) makes a distinction between the natural machines mentioned above, which God created and which constitute monads (individual substances), and 'artificial automatons', which are created by human hands and are thus inferior.

The one possible contemporaneous exception to this is Spinoza (1992: 256), whose doctrine of necessitarianism – that is, the claim that there is only one possible world, and thus no metaphysical contingency – allows him to characterize the soul as operating 'according to fixed laws, a sort of spiritual automaton'. More overtly, though, it is only in the quirky and almost entirely forgotten work of Julien Offray de La Mettrie (1709–51), an unabashed materialist, mechanist and determinist, that we see the notion of the human as merely and literally a machine:

> the human body is a clock but so huge and cleverly constructed that if the cog which tells the seconds happens to stop, the one which tells the minutes goes on turning, in the same way as the cog for the quarters continues to move, and so do the others, when the first ones are rusty or out of order.
>
> (1996: 34)

La Mettrie, in an argument that would only really find adherents (albeit unintentional ones, given how little his work has been discussed) in the nineteenth century, completely dismisses Cartesian dualism, proposing instead that the universe is composed of a single substance, out of which all beings are made, thus concluding that humans cannot be regarded as fundamentally different from any other type of entity – living or otherwise. La Mettrie's rather provocative claim (which is also perhaps somewhat playful, particularly given his similar and even

more fanciful claim that man is merely a sophisticated form of plant) received little attention and even less support during his own time, but in many ways it was indicative of the processes and ideologies that would transform the Western world over the next two-and-a-half centuries.

Industrialization

By the nineteenth century the processes of industrialization had begun in earnest across Western Europe, and with this came the advent of sophisticated, automated digital technologies. The first of these was Joseph Marie Jacquard's loom, first introduced in 1801. This rather remarkable piece of machinery used replaceable chains of punch cards on which patterns for fabrics were designed and stored. It could then automatically weave surprisingly complex textiles on the basis of these patterns, with little direct human intervention. Given that multiple cards could be chained together in a single sequence, there was no theoretical limit to how large or complex one of these patterns could be, allowing the production of what we would now refer to as high-resolution images. This loom, the basic design of which is still in use today, was not a computer in the sense of performing calculations, but what it demonstrated was the ability to produce a machine within which one could effectively distinguish between hardware and software – it was not limited to the patterns built into it by its creator, because new designs could be programmed at will. Just like the computers we use today, its capabilities were extensible through programming.

Media are, at least in part (to paraphrase McLuhan), an extension of the human mind or body. This is not to suggest that this is their sole function, or that this extension is necessarily a good thing, but it does nonetheless reflect the broad trajectory of media development from writing onwards. One of the most profound effects of the printing press, as we have already remarked, was the increased accuracy that it gave for the reproduction of texts; but perhaps even more important was the way that it sped up this process. Where once scribes were forced to laboriously copy manuscripts by hand, Gutenberg's invention marked the beginning of the mass production of literature. The same can be said for the Jacquard loom, which accelerated the production of woven textiles precisely by taking human inefficiency out of the equation. Like so many inventions of the era, it was an automaton that, in certain aspects of its functionality, actually appears to *improve*

upon the people that it was replacing. What it introduced was not only an increased pace of production, but also an increased standardization of the end-product, given that it was no longer reliant upon the unpredictabilities of human labourers, in the same way that the printing press freed the duplication of manuscripts from the errors of the scriptorium.

Charles Babbage (1791–1871), an English inventor (among numerous other talents) who is typically regarded as the father of the modern computing, was directly inspired by the loom in the (never completed) development of his two mechanical computers, which were the first to contain all the elements that characterize a computer as we know it, providing the basic model from which all subsequent computers would in some sense be shaped. Babbage was an almost fanatical admirer of the industrial process, frequently visiting factories to observe the manufacture of goods, and found inspiration in the Jacquard loom not only as a result of its design, but also because he was deeply impressed by the way that its standardization, systematization and efficiency built upon the example already set by the factory. In fact, the factory was already in itself a kind of automated machine, with human workers acting as mere replaceable (and sadly, in an age prior to any conception of occupational health and safety, expendable) parts within a complex and highly organized operation.

Although mechanical calculators already existed by this point, they were expensive and often unreliable, so instead large-scale calculations were for the most part performed using printed tables of logarithms. Frustrated by the slow and expensive process of producing mathematical tables, Babbage (1832: 164) – who observes that it is 'continually necessary for each producer to be on the watch, to discover improved methods by which the cost of the article he manufactures may be reduced' – saw the potential of a machine that could automate such calculation, thus reducing the need for expensive human labour. To 'calculate and print a *series* of results according to given laws' was Babbage's (1864: 41, 49) intended purpose of the Difference Engine, which if completed could have added, subtracted and solved differential equations through a complex series of gears and, most importantly, could have performed 'the whole operation without any mental attention when once the given numbers have been put into the machine'. Babbage (1864: 118) was not satisfied with this, however, and thus sought to design a new machine – the Analytical Engine – which was

not limited merely to addition (and subtraction via the addition of negative numbers), but as 'a machine of the most general nature' which could perform all basic arithmetical functions in a far more sophisticated fashion.

What this required was the mechanization and automation of almost every element of the machine's functionality. Rather than relying upon a human operator to provide the rules of the game, so to speak, as was the case with the Difference Engine, these rules were instead transcribed into the machine itself. The Analytical Engine was able (at least in theory) to obsolesce the human operator through its use of punched cards connected by ribbons, adopted of course from the loom. What the use of these cards offered was the possibility of 'teaching the Engine to foresee and then to act upon that foresight' (Babbage 1864: 114) – that is, not only to store variables inputted by a human operator, but to remember the results of its own calculations and to use these results as the basis of new operations. It was through an attempt to document the functionality of this mechanism that Babbage's friend Ada Lovelace, the second daughter of the Romantic poet Lord Byron, developed what is now recognized as the first computer program, although she lacked the appropriate hardware to actually execute it (Plant 1997).

By separating what he termed the 'store' from the 'mill' – the former referring to the computer's memory in which all variables are stored, and the latter to the central processing unit in which the arithmetical operations are actually performed – Babbage (1864: 117) had conceived the first example of that which Alan Turing (2004: 383) would, a century later, refer to as a *universal machine*:

> when we have decided what machine we wish to imitate we punch a description of it on the tape of the universal machine. This description explains what the machine would do in every configuration in which it might find itself. The universal machine has only to keep looking at this description in order to find out what it should do at each stage. Thus the complexity of the machine to be imitated is concentrated in the tape and does not appear in the universal machine proper in any way.

In the case of such a machine, Turing (2004: 393) argues, one can imagine that after it had been operating for a significant length of time, 'the instructions would have altered out of all recognition, but nevertheless still be such that one would have to admit that the machine was still doing very worthwhile calculations', at which point 'one is

obliged to regard the machine as showing intelligence'. Although it was never completed, the importance of the Analytical Engine upon subsequent digital computation is indisputable. The spirit of Enlightenment rationalism, with its focus upon the means of calculation as the basis of scientific enquiry, finds its unprecedented technical instantiation within the yearning to delegate such tasks to these far more efficient and accurate machines. Babbage (1864: 59) underscores the importance that 'calculations made by machinery should not merely be exact, but that they should be done in a much shorter time than those performed by the human mind', for no longer could the human intellect, in its limited capacities, keep up with the perpetual demand for information encouraged by the fecundity of computational processing.

From Babbage's early although never finished machines came the proliferation of subsequent, actually operational, calculating machines over the second half of the nineteenth century, beginning with Thomas de Colmar's Arithmometer in 1851, and perhaps best exemplified by the electric tabulating system developed by Herman Hollerith (the founder of IBM) in 1889 as a means of automating the laborious task of collating the results of the United States census. It became increasingly normal to assume the necessity of utilizing such machines not only in the production of material goods, but also in the production, storage and processing of information and knowledge – activities over which the human mind was once assumed to have a monopoly. Around the same time, the camera, phonograph and then finally cinema offered new means for archival, allowing the cataloguing of experience in a manner never before possible. Although this doesn't initially seem to have much connection to the calculation of these early computers, two points have to be kept in mind. First, the invention and development of these media was enabled (and therefore also delimited) by the mathematical intelligibility of calculative reason; and second, the dynamic mode of archival encouraged by such media contributed to the sense of a world that cannot be read (like the scholastic Book of Nature), but must be constantly captured and processed.

As we already know, during the eighteenth century, philosophers – the key examples here being Friedrich Nietzsche, Henri Bergson and Edmund Husserl – began to question the assumptions that were driving such developments. In his increasingly lurid later books (from *Thus Spoke Zarathustra* onwards), Nietzsche attempts to develop a sustained critique of Christian theology and morality, which he views as deeply implicated in the direction that Western civilization has

taken over the past 2,000 years. His famed concepts of this period – the death of God, the will to power, *ressentiment*, master and slave morality, the overman – are all designed to counter what he views as the deleterious influence of this aforementioned morality upon the creative (and destructive) spirit of humanity. His early work, however – or, perhaps more correctly, his middle period, which encompasses *Human, All Too Human*, *Daybreak* and *The Gay Science* – although still in many ways thematically commensurate with these later ideas, is far more interested in the changing place of the creative individual within industrial society. In one of his most powerful passages from this period, Nietzsche (1996: 97) argues that

> [t]he desire to create continually is vulgar and betrays jealousy, envy, ambition. If one is something one really does not need to make anything – and one nonetheless does very much. There exists above the 'productive' man a yet higher species.

Like so many of his Romantic forebears, whom he frequently criticizes for their nationalism, anti-Semitism and inability to conceive of progress outside of a return to tradition, Nietzsche (1996: 378) is highly attuned to the changes that new technologies had wrought upon the tempo of everyday life: 'the press, the machine, the railway, the telegraph', he observes, 'are premises whose thousand-year conclusion no one has yet dared to draw'. In particular, he suggests that the industrial machine, 'itself a product of the highest intellectual energies, sets in motion in those who serve it almost nothing but the lower, non-intellectual energies' (1996: 366), the consequence being that it in effect dulls the creative potential of those who are affected by it, by requiring that all their energies be utilized in service of the ever-accelerating demands for production and consumption. True art and philosophy, he notes, can only really be produced under conditions of contemplation and reflection – times when one can work according to one's own needs, rather than the external demands of the industrial society.

Although this critique of technology would become less central in subsequent works, what does emerge in his later writings is a sharp critique of mechanistic philosophy. Arguing that of 'all the interpretations of the world attempted hitherto, the mechanistic one seems today to stand victorious', Nietzsche (1967: 332) goes on to critique such conceptions of causality – that is, those which had become the

basis of scientific explanation – as ignoring the internal force of entities. 'It is an illusion that something is known when we possess a mathematical formula for an event: it is only designated, described; nothing more!' (1967: 335) – in effect, what Nietzsche is arguing is that mechanistic understandings of the world attempt to convert the multiplicity of forces that make up the world into abstract human language.

A similar critique motivates the philosophy of Bergson, who makes a division between the modes of thought (derived from Kant): the *intuition*, which is an undivided continuity and the *intellect*, which breaks up this continuity into discrete units – either words or objects. It is through the latter, argues Bergson, which is inherently spatial, that we typically experience the world and yet, he suggests, we can only experience true freedom when we understand ourselves and the world around us in entirely temporal terms – that is, as a *duration*, as he calls it. As in Nietzsche's work, this is a sharp critique of an increasingly mathematized world. For Bergson, it is the goal of philosophy to reject the abstractions that come from thinking in spatial terms. At one point Bergson (1911: 306) even likens the intellect to a film projector, arguing that 'the mechanism of our ordinary knowledge is of a cinematographical kind', in the sense that both are composed of discrete frames perceived as if in continuous motion.

The same might be said of Husserl, the founder of an influential school of philosophy known as *phenomenology*, which sought to discover the fundamental essences of experience and consciousness by suspending all preconceived assumptions regarding the existence of an external world. Husserl (1991: 11), as with Bergson, is determined to identify a duration of consciousness that is primary to and incompatible with the typical understanding of time as a series of successive instants. Using the example of a musical melody (a metaphor which Bergson also utilizes sometimes, not coincidentally), he notes that if we understand time in this latter fashion

> we would be quite incapable of noticing the relations among the successive tones; in each moment we would have a tone, or perhaps an empty pause in the interval between the sounding of two tones, but never the representation of a melody.

In all of these cases' emphasis upon the primacy of experience, memory and the continuous flow of duration, there is a distinctly temporal focus – what is being critiqued, at least in part, is the changing tempo

of everyday life imposed by industrial capitalism. One of the great peculiarities of such philosophies – from the Romantics onwards – is that its particular understanding of humanity and its relationship to nature could only really have emerged as a result of the vast increase in scientific knowledge and technological power engendered by the Enlightenment, and yet this understanding came about precisely as a reaction *against* such developments. Appropriately, these philosophers, who sought to procure for themselves a finely tuned sensitivity for both the internal environment of the imagination and the external environment of nature, found themselves quite disturbed by the way in which new technologies had dramatically altered the tempo of urban life. The demand for endless productivity was not confined to workers in factories; rather, it was becoming increasingly universal.

Computing

In Chapter 3, we examined a legacy of mechanistic thought driven by the overarching presupposition that the truths of the universe (and of the human beings that reside within it) are entirely apprehensible through calculative rationality – that, in other words, reality is entirely reducible to the structures of human reason. Arguing in favour of the importance of calculation and arithmetic, Plato (1997: 1142) notes that, '[t]hey are compulsory for warriors because of their orderly ranks and for philosophers because they have to learn to rise up out of becoming and grasp being, if they are ever to become rational'.

Appropriately then, it was during the Second World War, and the cryptological developments that occurred during it, that modern electronic computing found its fruition. 'The digital view of information', writes Lisa Gitelman (2006: 98), 'has Enlightenment roots, but it emerged with force in the post-World War II, post-Manhattan Project era, as part of a widely shared anxiety about the continued efficacy of science in US life'. Almost all of the key figures in the development of digital computing and its concomitant theorization at this time – Vannevar Bush, Grace Hopper, Claude Shannon, Alan Turing, John von Neumann, Norbert Wiener, among others – were all heavily involved in various ways in the technical and scientific endeavours of the war, both in terms of weaponry (such as the race towards the atomic bomb) and cryptography (such as the breaking of the code used in the German Enigma machine).

In terms of cryptography, the demand for increasingly high speed code-breaking in order to keep up with the complex military operations

of both the Germans and Japanese set in motion a rapid development in computing technology. Turing and Shannon, the former working in the United Kingdom, the latter in the United States, both worked heavily on this cryptanalysis. Turing's bombe – an electromechanical computer based upon numerous series of rotors – was largely successful in revealing the daily settings which the Enigma machine used to vary its cipher, and eventually formed the basis of the Colossus, introduced in 1943, which was the first fully electronic computer (utilizing vacuum tubes instead of rotors or electromagnetic relays), providing the means through which the Allies were able to decrypt the Lorenz cipher utilized by the German High Command. Turing (2004: 421) in particular was greatly inspired philosophically by these efforts, making the argument that:

> [t]here is a remarkably close parallel between the problems of the physicist and those of the cryptographer. The system on which a message is enciphered corresponds to the laws of the universe, the intercepted messages to the evidence available, the keys for a day or a message to important constants which have to be determined.

It is hard not to see the similarities between this statement and the rhetoric of the Enlightenment philosophers who sought to unlock nature's laws through calculability.

In the computers that we've already discussed – those of Pascal, Leibniz and Babbage – we have emphasized that these were digital, but they were not binary; that is, they operated on the basis of combinations of integers from 0 to 9. It was not until after Shannon's master's thesis, entitled 'A Symbolic Analysis of Relay and Switching Circuits', that engineers began to focus their efforts upon developing a truly binary means of computation. In this essay, which was published a year later, Shannon (1938: 722) builds upon the algebraic innovations of George Boole, who himself followed Leibniz in seeking to develop a universal symbolic language with which all thought could be represented, in order to argue that it 'is possible to perform complex mathematical operations by means of relay circuits' and, as such, that 'any operation that can be completely described in a finite number of steps using the words "if", "or", "and", etc. […] can be done automatically with relays'.

Although writing specifically in relation to the call routing switches used in the public telephone network (designed to replace human switchboard operators), Shannon effectively provided the still nascent

computing industry with a standardized circuit design from which binary digital computers could be engineered. Appropriately, it would be at Bell Laboratories (the research and development division of the Bell Telephone Company) where Shannon would formulate the principles for which he is best known – those of what would come to be known as *information theory*. Most notably, in his attempts to identify the most efficient means of transmitting data, Shannon found that he had produced a general theory of information – *the mathematical model of communication*, also commonly known as the *Shannon–Weaver model*. We will discuss this model further in Chapter 7 so there is little need to dwell upon it here; but it is crucial to note that information theory at least appeared to fulfil the rationalist desire for a universal symbolic language. By taking no interest in the actual content of a message, but merely the accuracy of its transmission, information theory was able to reduce the description of communication processes to probabilities. These probabilities, which measure the level of uncertainty in a message, are referred to in information theory using the term *entropy*, derived from the second law of thermodynamics.

This notion of entropy is also crucial in the development of the field of *cybernetics*, which was developed around the same time. 'The philosophy of Leibniz', writes Wiener (1961: 12), who is the figure most responsible for the creation of this discipline, 'centres about two closely related concepts – that of a universal symbolism and that of a calculus of reasoning. From these are descended the mathematical notation and the symbolic logic of the present day.' Like information theory, cybernetics is reliant upon the assumption that communication may be formalized in terms entirely grounded in mathematics and logic. In large part, early cybernetics focuses upon the concept of *homeostasis*, which describes the way in which systems or entities maintain themselves in a metastable form through a constant process of self-correction. This metastability is to be achieved, Wiener (1954: 17) proposes, through 'control and communication', a 'process of our adjusting to the contingencies of the outer environment, and of our living effectively within that environment'.

Whereas the Enlightenment rationalists still tended to preserve some distance between the human being and the automaton, Wiener (1954: 33) is largely unwilling to make such a concrete distinction, arguing that 'the nervous system and the automatic machine are fundamentally alike in that they are devices which make decisions on the basis of decisions they have made in the past', meaning that, in effect,

they both learn from their successes and failures, able to alter their behaviour based upon the previous data that they have produced. This was not a particularly unusual position for likeminded thinkers at the time. Turing (2004: 416), for instance, argues that 'a man provided with paper, pencil, and rubber, and subject to strict discipline, is in effect a universal machine'; likewise, von Neumann (1992: 5), who was responsible for the now-standard architecture of electronic computers, claims that 'neuron functions can be imitated by telegraph relays or by vacuum tubes'. Although he distinguishes between simple machines and cybernetic machines, the latter of which necessarily depend upon communication with their external milieu in order to maintain their metastability, the category of the cybernetic is not at all confined to just humans. In particular, Wiener (1954: 24–5, 33) defines these machines by building upon his work on automated anti-aircraft artillery in order to develop the notion of *feedback*, which is 'the property of being able to adjust future conduct by past performance', and thus 'control the mechanical tendency toward disorganization; in other words, to produce a temporary and local reversal of the normal direction of entropy'.

'The organism', Wiener (1954: 48) goes on to argue, 'is not like the clockwork monad of Leibnitz [*sic*] with its pre-established harmony with the universe, but actually seeks a new equilibrium with the universe and its future contingencies'. This notion of a *negative* feedback loop, whereby a person or machine is able to effect a contingent state of homeostasis through self-regulation, is contrasted with *positive* feedback, which 'adds to the input signals, it does not correct them' (Rosenblueth *et al.* 1943: 19), leading to instability rather than equilibrium. The concept of the cybernetic organism then, by presenting the human being as merely one particular type of machine, returns us quite directly to the philosophical imaginings of the automaton that motored so much Enlightenment thought. 'The idea behind digital computers', argues Turing (2004: 444), 'may be explained by saying that these machines are intended to carry out any operations which could be done by a human computer', implying that the computer is merely an imitation of human thought, in the manner of an automaton. At the same time, though, it is Turing's conceptualization of the universal machine, with its ability to adjust its own functionality through a constant feedback loop between its input and output, which actually provides the ideal model for the cybernetic organism.

The neural pathways are perceived by Turing (2004: 42) as directly analogous to the electrical signals which drive the modern digital computer, albeit with some slight differences:

> the nerve has many advantages. It is extremely compact, does not wear out (probably for hundreds of years if kept in a suitable medium!) and has a very low energy consumption. Against these advantages the electronic circuits have only one counter attraction, that of speed. This advantage is however on such a scale that it may possibly outweigh the advantages of the nerve.

The brain, in such a context, is not so much the model for digital computers as it is a competitor; one which, in the ever-increasing demand for rapid calculation, may for the first time find itself in a losing position. 'The fundamental metaphorical message of the computer, in short,' writes Postman (1992: 111), 'is that we are machines – thinking machines, to be sure, but machines nonetheless'.

Perhaps most telling is the *Church–Turing thesis*, which states that 'the "computable" numbers include all numbers which would naturally be regarded as computable' (Turing 2004: 74) – or, in other words, that any function able to be performed by a human computer can be carried out in equivalence by a universal Turing machine. While this hypothesis does not in itself amount to proof that the universe is entirely computable, a question that can only be solved in empirical rather than formal terms (and thus can perhaps never be solved in an adequate manner), it allows for both the universe and the human mind to be defined as, or analogous to, a computer, thus justifying the continued scientific investment in digital computing as a means of representing, in terms comprehensible within the confines of our limited intellect, the infinitely complex workings of natural phenomena. The question of whether the human being is *actually* reducible to the terms of computing and information processing, however, is a topic that we will return to in Chapter 8.

6 Form, matter and simulation

In the early chapters of this book we explored the importance of Plato's theory of forms for subsequent understandings of the world. Aristotle, as Plato's most famed and successful student, did not abandon the notion of forms entirely, but he approached them in a far more nuanced fashion, taking into account many of the criticisms of the theory, including those of Plato himself. Although the complexities of Aristotelian philosophy lie far beyond the scope of this book, the fourfold conception of causality that he introduces still exerts influence today, particularly terminologically. People 'do not think they know a thing till they have grasped the "why" of it', Aristotle (2001: 240) observes. This 'why' is known as the *cause* of a thing. He describes four separate kinds of cause, each of which contribute to explaining the genesis of any individual object: efficient cause, material cause, final cause and formal cause.

The first of these, efficient cause, is today, for all intents and purposes, synonymous with causation as such – it describes that which results in an object either moving or changing in some way. The second, material cause, refers to the raw material from which an object is composed. Final cause is the purpose of an object: the teleological determination that acts at every step of its genesis. Last, formal cause, which Aristotle adapts from Plato's theory, refers to the configuration or archetype of what an object is to be. Therefore, while Plato views forms as existing in a realm entirely transcending the things that we perceive through our senses, Aristotle sees them as residing within the things themselves. In this fashion, Aristotle instigates a kind of philosophy that is much more conventionally 'scientific' than that of Plato, in that the cause of things is to be ascertained through observation of those very things, rather than attempting to think their perfect form beyond the sphere of perception.

It is for this reason that Aristotle is often regarded as the first scientist. Although he did not perform any experiments himself that we know of, and in many cases relied upon supposed facts clearly incongruous with observational data (his claim that women bear fewer teeth than men is particularly notorious), by putting forward the idea that truth can be acquired through the senses, he made observational and experimental science a genuine possibility. At the same time, though, Aristotle's separation of form from matter, as derived from Plato, leaves a somewhat controversial legacy in terms of its effects upon subsequent understandings of communication. His *hylomorphic* schema, in which matter is shapeless and passive, needing form to give it definite qualities, has led to both a conception of the mind or intellect as distinct from the body, which many scholars (particularly feminist theorists) have criticized in recent years, and an ignorance of the role of media in shaping messages. Even in the mid twentieth century, as we shall explore, models of communication still tended to assume that the role of a medium was merely that of an information channel, transmitting an already formed message.

The flight from matter

In the first chapter of this book we alluded to the way in which many ancient philosophers regarded the material world with scepticism, or sometimes even outright hostility – as Innis writes, Thales, the first Western philosopher, evinced 'a disregard of the data of experience but a recognition of the autonomy of thought' (2008: 110). Plato was particularly critical of the physical body, viewing it as a mere distraction to the acquisition of wisdom and the contemplation of the forms. This is why he argues that death is not something that any philosopher should be afraid of, for it is in death that one's soul is finally separated from this corporeal hindrance that is the body, and is returned to a realm of truth and virtue. It is also worth noting that, for Plato, one does not *gain* knowledge in the way that we might typically think of it. Instead all knowledge is posited as always already residing within the soul – it just happens to have been forgotten as a result of the distractions of physical existence. As such, for Plato (1997: 886), 'finding knowledge within oneself' is the same thing as recollection – we don't ever acquire new knowledge, we merely acquire new falsehoods, misleading us and dragging us away from the path towards truth. It is only through recollection that we might find the truth that is already

written in our souls – the boundless, unvarying archive of truths that we all carry within us.

Although Plato frequently writes of the material world (i.e. the world of sensibility and representation, as opposed to that of the forms) in almost unwaveringly condemnatory terms, he rarely discusses the concept of *matter* itself, despite this being a frequent concern for later metaphysicians, beginning with Aristotle who, while acknowledging the importance of matter in the formation of entities, sees it as merely an inert substrate out of which entities are formed. Matter, Aristotle infers, can be transformed in many ways – for example, gold can be moulded into the form of a certain entity and then melted down and reshaped again into another – and, as such, must be regarded as less crucial to the singular identity of that one object than its form, which always remains the same. Some objects, following the Aristotelian model, may achieve this form more or less adequately – in the case of artificial objects, a chair or table for instance, this would probably come down mainly to the skill and competence of the carpenter – but the form itself does not alter, merely its manifestation within this matter.

Other schools of philosophy at this time also held ethical and metaphysical positions regarding the material world, although generally not as sharply dualistic as those of Plato. Both the Cynics and the Stoics seek to live a life in accord with nature and virtue, and while both schools have different means to achieve these principles (as well as differing conceptions of what these principles actually are), they both tend towards an ascetic existence full of toil and hardship. For the Cynics, it is only through such practices that one is able to attain a life of freedom and self-sufficiency, and thus of happiness, unshackled by the absurd and petty restrictions of social convention that make men and women greedy, lazy and complacent. According to the Stoics, by contrast, who argue that the world is composed of passive matter animated by the divine force of God which exists in all beings, such a life teaches one to withstand suffering and the seemingly arbitrary hurdles that Fate throws in front of us, such that we might learn to overcome our passions and live a life of clear, rational thought.

It was only the Epicureans who really confidently embraced the material world, who celebrated pleasure (referring primarily to the absence of pain) as the key to a virtuous life. Although the Epicureans are often viewed today as hedonists, embracing excessive luxury as the source of all happiness, in fact what they emphasize is that, while

such overindulgence may cause pleasure in the short term, it is also likely to lead to pain. Virtue, according to the Epicurean account, necessitates knowing one's own limits, such that one can live a life of maximal pleasure and minimal pain. An embrace of the material world lies at the very heart of Epicurean physics, which are derived in turn from the atomism of Leucippus and Democritus. In positing a universe composed entirely of imperceptible, indivisible particles within a void, the motion of which is entirely responsible for the emergence of a sensible world, the Epicureans instantiate a materialist philosophy that is notable in two ways.

First, whereas Democritus establishes a clear division between sensory perception, which he explicitly declares to be false or misguided, and a bottom layer of reality (the atoms and void) out of which the entities that we perceive are formed, Epicurus (1994: 6) argues on the contrary that it is 'necessary to observe all things in accordance with one's sense-perceptions', thus establishing a direct connection between one's empirical experience of the world and the truth of it. The second notable part of this atomist philosophy, however, and the part that is perhaps more relevant when discussing materialism, is its dedication to naturalism – the refusal of any supernatural explanations for the world.

Although this is something that, to some degree at least, united all of the pre-Socratic philosophers – in the sense that they tended to reject the anthropomorphic, polytheistic Greek pantheon of gods and goddesses for either vague notions of a divine intelligence or *logos*, or a complete agnosticism – by reducing all phenomena to the motion of atoms, however, the atomists developed a mechanistic understanding of the world that left any kind of divinity out of the equation. To quote Lucretius (2001: 7), an Epicurean from the first century BCE whose Latin poetry provides the most thorough outline of the school's philosophy that we have available to us:

> This terrifying darkness that enshrouds the mind must be dispelled not by the sun's rays and the dazzling darts of day, but by study of the superficial aspect and underlying principle of nature.
>
> The first stage of this study will have this rule as its basis: nothing ever springs miraculously out of nothing.

Outside of Epicurean circles, however, such stringent naturalism would only really catch on as a dominant philosophical trend during the Age

of Enlightenment, when many scientists and philosophers – Pierre Gassendi (1592–1655), who vigorously opposed many of Descartes' theories, is possibly the earliest key example – came to gradually reject non-physical explanations of phenomenal reality. From antiquity through the mediaeval scholastics, Western philosophy tended quite decidedly towards an emphasis upon the soul over the corporeal body, and the spiritual world over its material counterpart. Particularly explicit on this point is the philosophy of Plotinus (*c.* CE 204–70), one of the last ancient philosophers, and a crucial influence upon mediaeval Christian philosophy from Augustine onwards. Plotinus was a devoted Platonist – he is often regarded as the first neo-Platonist, referring to a particular tradition of philosophy that existed primarily from the third to fifth centuries CE, more than five centuries after Plato's death – who attempted to synthesize Plato's numerous theories into a coherent philosophical system. His various writings, which present a complex and intensely mystical account of the nature of the cosmos, were edited and compiled by his student Porphyry into a single volume, *The Enneads*.

In Chapter 1, we briefly mentioned Plato's notorious *unwritten doctrine*, whereby he refused to record in written form his most abstract, most opaque – and according to some interpreters, most central (although this is a controversial opinion) – philosophical principle, that of the One, which he presented as equivalent to the Good, and the formal essence of all that exists. Although Plato eschewed writing, the fashionable medium of his day, when it came to the transmission of this particular doctrine (with the exception of certain less than transparent passages in *The Republic*, where it is described as the Good), we are lucky that later philosophers did not have the same qualms.

According to Plotinus's account – which follows this unwritten doctrine quite closely, in addition to using Plato's other, better known teachings – the absolutely basic, supreme principle of the universe is the One, which is a totally singular, transcendent entity that is absolutely immutable and unchanging, and which cannot be divided or multiplied in any fashion. The One, which is eternally self-sufficient, continually overflows, sending forth less perfect entities than itself which emanate outward. Such entities do not diminish the One in any way, for this process of emanation is in no way privative – the One is always singular and can never be otherwise. There are several different levels of emanation, each less perfect than the last. First, there is the Intellect,

which Plotinus associates with Plato's *demiurge* and the eternal forms; second, there is the Soul, which is divided into manifestations, the last being the human soul; and then finally, there is matter, which he regards as being not only the most inferior kind of emanation, but fundamentally evil, for it is irrevocably separated from the Intellect and impedes the soul's return to the One.

Given that Plotinus views matter as the enemy of all intelligibility, meaning that one's everyday experience of the world is shrouded in illusion and falsehood, and driven by delusory desires for ephemeral objects, it becomes the ethical task of the human soul to effectively escape the trappings of the material world within which it is normally situated, and to instead achieve a contemplative state of consciousness set apart from the body and matter more generally.

In the dialogue *Theætetus*, Plato (1997: 195) recounts a discussion between Socrates and Theodorus, a Greek mathematician, wherein the former states:

> it is not possible, Theodorus, that evil should be destroyed—for there must always be something opposed to the good; nor is it possible that it should have its seat in heaven. But it must inevitably haunt human life, and prowl about this earth. That is why a man should make all haste to escape from earth to heaven; and escape means becoming as like God as possible; and a man becomes like God when he becomes just and pious, with understanding.

It is precisely this notion of an escape – a flight away from matter towards the One – that Plotinus adopts in his own philosophy. The human soul, he argues, yearns to escape the material world and be reunited with its source. Through contemplation of pure beauty (another concept taken directly from Plato) unsullied by corporeal distractions, the human soul comes to recognize itself in relation to the highest Soul. It is through this journey away from matter that one is able to attain true happiness, for one comes to realize in this contemplation of the forms and the Intellect that one's happiness is not related in any way to the transitory desires of the body, but rather, in the eternity of the soul, and that the former represents a mere moment in the latter's existence.

In at least a superficial sense, Plotinus's approach to the relationship between the material and the immaterial is not really all that different from that of Plato, viewing matter as a distant, heavily corrupted (and in some sense evil) emanation of the One. Bereft of form, it is an

active impediment to one's apprehension of the eternal truth. Plato is the first philosopher of *simulation*, albeit one who views such simulation in profoundly negative terms. The material world, according to his account, attempts to imitate or model the truth of the forms from which it is derived, but it will never be anything more than a derivative product. Plotinus follows him in this basic argument. Yet while Plato develops a fairly simplistic opposition between the divine realm of the forms and the sensible realm in which we encounter these forms' inadequate copies and simulacra, Plotinus by contrast provides a complex, multilayered and intensely mystical account of mediation, whereby the constantly overflowing force of the One continually produces a circulation of thoughts, desires, representations and materialities, all of which are in some sense imperfect and yet are simultaneously still ultimately derived from the divine nature.

The odd thing about Plotinus's account, however, is that although he takes great care to underscore that the One is in no way dependent upon or affected (positively or negatively) by its emanations, it still remains the case that the One, which he associates inextricably with the Platonic principle of the Good, does in some way actually produce evil, in the form of matter, for all that is possible originarily emanates from the One. Our experience of the sensible world can therefore, for Plotinus, never really be imagined apart from this basic, irreducible principle from which all being springs. It is for this exact reason, however, that Plotinus is able to explain the possibility of the human soul's flight away from matter, for the contemplation of the forms (and thus the Intellect) from the perspective of the material world is possible precisely because both still emanate from a single basic source, the One.

In the work of Plato, to the contrary however, there are certain moments when it apparently occurs to him that, in the words of French philosopher Gilles Deleuze (1994: 128), 'the different, the dissimilar, the unequal […] may well be not merely defects which affect copies like a ransom paid for their secondary character or a counterpart to their resemblance, but rather models themselves'. In other words, when Plato (1997: 195) claims that 'there are two patterns set up in reality. One is divine and supremely happy; the other has nothing of God in it, and is the pattern of the deepest unhappiness', the former of which is of course the eternal goodness of the forms, and the latter the continual flux and change of the sensible world, he is able to conceive of a world that is nothing other than simulation – a

terrifying realm utterly detached from all truth and virtue, where the forms on which the world is modelled are nothing other than that which he detests.

Although he sees no appeal to such a world, hence his continued quest for contemplation of the static, immaterial forms, it is in such a realization that theories of simulation and virtual reality first begin, at least in the Western philosophical tradition. Although these are not necessarily concepts that have the same currency that they once had perhaps ten or twenty years ago, the development of electronic computing and the internet was, in large part, driven by a flight away from matter little different than that of Plotinus, combined with the imagining of a simulated world wholly detached from our everyday experience. And while the latter notion is not wholly compatible with Plato's own concerns, given that he views matter itself as the simulation (or at least, as a substratum that enables such simulations), it is, we would contend, at a basic level derived from this duality that Plato established. What the computing revolution of the twentieth century facilitated was the unsurpassed ability to *imagine* the practical and seemingly achievable divorce of thought from matter – the at least partial fulfilment of Plotinus's return to the One. Before we can discuss this further, however, we must first examine the way in which later philosophers returned to this question of simulation.

Scepticism and empiricism

The doctrines of Plotinus, and in particular his notion of the journey of the soul away from matter towards incorporeal contemplation of the forms and the One, while not as well-known as the dialogues of Plato upon which they were primarily inspired, had a substantial influence upon the mediaeval Christian philosophy that we have already discussed. Both Saint Augustine and Pseudo-Dionysius, the two key Christian Platonists, derived their understandings of Plato primarily from the far more theologically compatible writings of Plotinus, rather than from those of Plato himself. In fact, Augustine's *Confessions*, possibly the first autobiography in Western literature, describes in very personal terms his journey away from the transient material world towards an apprehension of God, becoming a Christian. In the absence of any substantial Latin translations of Plato *or* Plotinus, it was primarily through these authors that Plato's ideas remained in any form of circulation.

In Chapter 3, we discussed Descartes' formulation of the famed *cogito ergo sum* argument – 'I think, therefore I am' – and its relationship to his privileging of the stable truths supposedly attainable by the mind over the illusions often foisted onto us by the senses. Yet it was actually Augustine (2002: 55–6), rather than Descartes, who first made this argument:

> who would doubt that he lives, remembers, understands, wills, thinks, knows, and judges? For even if he doubts, he lives; if he doubts, he remembers why he doubts; if he doubts, he understands that he doubts; if he doubts, he wishes to be certain; if he doubts, he thinks; if he doubts, he knows that he does not know; if he doubts, he judges that he ought not to consent rashly. Whoever then doubts about anything else ought never to doubt about all of these; for if they were not, he would be unable to doubt about anything at all.

Put straightforwardly, you can doubt all you like your own existence, but the very fact that you are able to doubt at all inevitably confirms your own existence.

Augustine, therefore, is the progenitor of a particular pattern of thought that manifests in certain moments of Western philosophy, recognizing the necessary existence of a mind of some kind (this does not have to be a brain in the literal, physical sense) for thought, but which calls into question the *necessity* of an external, material world actually existing for us to perceive it as such. Just because we experience something, in other words, doesn't mean that it's actually there – it could just be a simulation. This is perhaps best exemplified by the previously discussed thought problem formulated by Descartes, whereby he imagines that an evil demon has taken control of his mind, projecting an image of the world that has no basis in truth. By having this illusion foisted upon him, Descartes – being assured of nothing other than the existence of his own mind – realizes that he could plausibly be convinced that an external world, including his own corporeal body, exists on the basis of his perception, even though this would merely be false data fed to him by this evil entity. Descartes, therefore, following the example of Augustine, presages far more precisely than the ancients the notion of simulation in the sense that we might think of it today, in that he is able to imagine the possibility of effectively producing sensory data, in order to trick the mind into thinking that it is somewhere that it isn't.

Obviously, in an age where media such as cinema, television and computers are everyday banalities – and in particular, where various

forms of interactive platforms, from video games to training simulators, are able to mimic, with often remarkable vividness and verisimilitude, the visual, aural and to some meagre extent even tactile experience of being in a real-world space – this may not seem like a particularly remarkable achievement. But what we must remember is that Descartes was working at a time when writing, painting and sculpture were the only media feasibly capable of mimicking our experiences of the world. These media, however, at best provide either a means of capturing such experiences within a motionless object, or a means of facilitating and bolstering one's imaginative capacities. Whatever the case, they are merely one more material object within an already material world – they don't transcend this world, they merely contribute to its aesthetic diversity. What Descartes is discussing is quite different though; it is a full-scale substitution of the senses, the creation of a new world out of nothing other than pure data transmitted to our minds.

The crucial shift here, which demarcates a quite dramatic change in understanding from Plato and his supporters regarding the nature of simulation, lies in the position of materiality. For both Plato and Plotinus the material world is unambiguously simulative. What this means, in effect, is that the physical world that we experience on a day-to-day basis is never anything other than an inferior imitation of the divine, immaterial forms. Wisdom and virtue, the basic tenets of philosophy from the pre-Socratics onwards, are found through a flight away from this matter, towards a more pure intellection. For Descartes, by marked contrast, the material world (which he designates, as we might recall, extension) is not in itself to be regarded as a simulation, even though he is somewhat suspicious of it, and advises that we would be better off seeking truth through the eternal truths of the mind rather than through the senses alone. When he imagines the scenario of the evil demon controlling his mind, he is not picturing a world of deceptive materiality; on the contrary, he is picturing a simulation divorced from all corporeal substance. Whereas Plato takes solace in his belief that beyond the world that appears to surround him is a realm of absolute truth, divorced from all materiality, Descartes fears that this same external world might be nothing other than a simulation.

In this fashion, Descartes (who, we should always keep in mind, does not dispute the existence of extension, even though he initially calls it into doubt) provides philosophy with a rather different perspective on the question of simulation. If our ordinary experience of the world is founded predominately upon the data that is fed to us through our

senses, he proposes, then it is entirely possible that this data could have no correlation to the external world (if it exists) at all. In other words, he opens the possibility of a simulation that entirely disconnects the mind from an external, material reality.

Such a concept is pushed even further in the work of the Bishop Berkeley, who effectively embraces the possibility that his predecessors had feared, understanding what we perceive to be an external, material reality as nothing other than a simulation connected to our minds by God. Berkeley drives empiricism to its logical, if painfully implausible, conclusion. If we cannot ever get beyond that which we perceive through our senses, he asks, then what reason do we have for believing that there *is* something beyond it? The naive move upon which all prior philosophy based itself was the demarcation of sense perception and reality – for Berkeley, the latter does not hide behind the former, for the two are already synonymous. Berkeley, argues Steven Shaviro (2003: 82), 'is probably the philosopher in the Western tradition who most fully anticipates our current ideas about virtual reality', for he approaches the vision of an entirely immaterial reality not with terror, but with a surprisingly impassive nonchalance. If there truly is no distinction between sense perception and reality, then he realizes that there is no good reason to fear such simulation – in fact, it is for all intents and purposes *identical* to a material reality.

Perhaps the best illustration of the simulative nature of Berkeley's (2003: 42) thought lies in the following statement:

> but, say you, surely there is nothing easier than for me to imagine trees, for instance, in a park, or books existing in a closet, and nobody by to perceive them. I answer, you may so, there is no difficulty in it; but what is all this, I beseech you, more than framing in *your* mind certain ideas which you call books and trees, and at the same time omitting to frame the idea of any one that may perceive them?

The conclusion that he draws from this example, which has gradually mutated into the now commonplace image of a tree falling in a forest with nobody around to witness it, is that 'the mind, *taking no notice of itself*, is deluded to think it can and does conceive bodies existing unthought of or without the mind, though at the same time they are apprehended by or exist in itself'. What this means, in essence, is that things quite literally do not exist unless one is thinking about them – either one is currently thinking about them in such fashion, as a result of immediate sensory perception or memory, and hence they exist,

or one is not, and hence they do not, for there is nothing external to thought and God. Reality is, for Berkeley, nothing other than the data that is being fed to or processed by the mind at any particular moment in time – there is nothing behind the simulation other than God Himself.

This is what separates the philosophy of the Bishop Berkeley in particular from that of Kant, for instance, who, while declaring quite decisively that we have no access to a reality that exists beyond appearances, never questions the existence of such a reality. At the same time, though, it is the dominance of the Kantian mode of thought in philosophy – this very notion of an external world that must exist, and yet of which we know nothing – that has allowed for the perpetuation (and in the final decades of the twentieth century, the intense amplification) of concepts of simulation and virtual reality both within philosophy, and also within the broader ideologies that have driven technological development, as we will go on to discuss.

At the core of any theory of simulation is a question of mediation, expressing itself in two distinct ways. First, in the notion that the human senses are inherently fallible and, as such, could provide an image of the world *utterly* distinct from its 'true' qualities; and, second, that the senses can themselves be affected (most notably by Descartes' evil demon) such that this false image of the world is not merely a reflection of the limitations of the senses, but is actually a result of one's senses being 'hijacked', for lack of a better word. Of course, according to such accounts, it is generally seen as still possible (if not likely) to think an absolute truth free of all such mediation – as was covered in Chapter 3, this is typically the role of the intellect, as distinct from the senses and the imagination, which is merely distracted by these latter faculties. From Kant onwards, however, mediation becomes effectively inevitable, for the very idea of experience is shown to be premised upon the mediation of sensory data with abstract categories and concepts and, as such, it becomes even more plausible to imagine an entirely simulative world, for the simple reason that, in the absence of an absolute truth to which we as humans may gain *direct* access, it becomes increasingly difficult to ascertain what a 'true' reality might look like outside of our own experience.

Virtual space

The interesting implication of these various theories of simulation from Descartes onwards is the possibility (most clearly expressed by

Berkeley, but implicitly by Descartes and Kant also) is that the material world, even if it does exist, simply isn't necessary for the human experience – that even if there was no corporeal external reality, it wouldn't really matter to us as humans as long as something keeps feeding us sensory data. The ideological ramifications of this are huge and will in large part shape our analysis in the second part of this book. If we come to understand that materiality is not necessary in such a manner, then we might begin to wonder whether Plotinus's desire for a state of contemplation and happiness entirely detached from corporeal concerns might actually be possible. We have already briefly discussed the significance of the mathematician and engineer Claude Shannon in the prior chapter, but it is crucial now that we spend a little more time investigating probably his key contribution to both computing and media theory: *the mathematical model of communication*, also commonly known as the Shannon–Weaver model, in reference to his co-author Warren Weaver.

Working for Bell Laboratories in the United States, Shannon developed this model, the purpose of which was to work out how a message could be transferred through any given channel without distorting it to the point of unintelligibility. In doing so, however, he realized that he had possibly created a universal theory of communication, able to conceptualize and mathematically represent any form of communication between two entities, human or otherwise. The problem with this model though – which is divided into five stages: an information source, a transmitter, a channel, a receiver and finally a destination – is that it replicates the hylomorphic tendencies that go back as far as Aristotle. In Régis Debray's (1996: 43) words, the Shannon–Weaver model treats information as

> something that circulates in a cable between a sender and a receiver. Something that changes place is passed around, to and fro, a little like the ball on a football field. Something that goes out from one brain to enter another.

It is presumed to be a stable object, not actually altered by any of these acts of transmission.

In other words, this model, by attempting to quantitatively measure the statistical possibilities of *accurately* transmitting a message, presumes that a message is already complete prior to transmission. Like Aristotle's theory of causality, wherein the *form* of an object is already complete from the very beginning, the question being simply

how adequately it is able to be represented within *matter*, giving the latter no active role within this process, the Shannon–Weaver model does not actually ascribe any real agency to the medium (the channel), instead merely asking to what extent it distorts a message that was fully intact at the time of transmission. Once more, it prioritizes form over matter, giving the former an active potentiality that the latter lacks and in doing so ignores the actual process of mediation. To quote Debray (1996: 44) again:

> The 'thing to communicate' does not exist prior to and independently of the one who communicates it and the one to whom it is communicated. Sender and receiver are modified from the inside by the message they exchange, and the message itself modified by its circulation.

Like so many philosophers, who take little or no interest in the way that their ideas are actually transmitted, and the ways in which these ideas might actually be shaped by such processes, the Shannon–Weaver model largely fails to account for the medium itself.

This is not an aberrant case of hylomorphism, however, but actually represents a single instance within a broad trend across the twentieth century. We see it prior to this, for instance, in the work of Pierre Teilhard de Chardin, a Jesuit priest and philosopher whose book *The Phenomenon of Man* (1959), written in the 1930s but not published for a couple of decades afterwards, predicts a new era in human evolution approaching, literally building a new layer around the Earth's biosphere, which he calls the *noosphere*, borrowing a term from the geochemist Vladimir Vernadsky. As Teilhard (1959: 243) describes it, the noosphere is the culmination of 'the spherical geometry of the earth and physical curvature of the mind harmonising to counterbalance the individual and collective forces of dispersion in the world and to impose unification', gathering together all consciousnesses within a unified, global network of thought which marks the spiritual rejuvenation of humankind and the abandonment of its materialistic distractions. The dream of the noosphere, although rubbished by biologists and other scientists at the time, had a surprising level of impact upon subsequent thought. McLuhan (1964: 67), for instance, was heavily influenced by the idea when developing his conception of the global village, asking: 'might not our current translation of our entire lives into the spiritual form of information seem to make of the entire globe, and of the human family, a single consciousness?', once again imagining evolution (in this case

technologically assisted) as a process of transcending the material in order to reach a stage of pure thought.

The concern with these ideas though, argues Cubitt (2001: 94), is that 'the eradication of the difference of mediation is a step towards a global unity, a single thinking and willing entity, a common subject of history', the problem being that 'it seeks a fullness without room for adaptation and change; and in its pursuit of absolute purity it imagines an impossibly complete language and an impossibly complete subject speaking it'. Put simply, what concepts like the noosphere or the global village (or perhaps even Habermas's public sphere) imagine is a time in which all perceived material obstructions to thought are transcended, such that the latter may be extended upon its typical limits, but, in order to do so, they effectively have to imagine a world where all distances and differences are eliminated. They exist within a philosophical legacy dating back to antiquity, which strives towards 'the plenitude of a present and an absolute presence' (Derrida 1997: 69) uninfected by the parasite of difference. What these utopian thinkers fail to account for is the way in which various social divisions – gender, race, class, sexuality and so on – might irreversibly mediate and condition our lived experience of the world, such that they cannot simply be so easily escaped.

The feminist philosopher Elizabeth Grosz (2001: 83), who has contributed significantly to this notion of embodiment, puts it well when she writes:

> The ideal of transcending the body, suppressing corporeality, abandoning the sticky mess of material that constitutes our entwinement with the real, seems to have been pervasive throughout both philosophical theory […] and the mathematical and computational sciences that came together with engineering to design and produce computers and the virtual spaces upon which they now both rely. These disciplines are threaded together through the fantasy of a certain (always only partial) divestment from bodily existence and experience, indeed through a kind of resistance to death itself, here seen as the final limit of a body.

This ideology, she argues, is encouraged in large part by the time–space compression and perceived immediacy of telecommunications technologies, which seem to offer the possibility of transporting oneself without material hindrances. Even a device as mundane as the telephone allows us to speak to people on the other side of the world, in 'real-time', as if they were standing next to us.

In spite of the apparent mysticism of such claims, the notions of the noosphere and the global village found a surprising revival within the digital counterculture of the early 1990s, in which Teilhard and McLuhan were hailed as visionaries by publications such as *Wired* for having, in effect, predicted the internet and the global proliferation of information that came along with it. Providing powerful metaphors for the way in which this new technology could affect our lives, it is not surprising then that so much of the discourse surrounding the internet in these early days showed a decided disdain for the material world, viewing digital media as the means for transcending the perceived limitations of this analogue realm. Like Plotinus, so many of these internet pioneers viewed themselves as utilizing computers to travel into a space where their bodies were no longer needed. From the anonymity of chat rooms and Multi-User Dungeons, to the three-dimensional immersion of early experiments in virtual reality, the internet was conceptualized by authors such as Howard Rheingold (1993), Nicholas Negroponte (1995), Sherry Turkle (1995) and Pierre Lévy (2001) as a space somehow detached from the world that had engendered it. Users no longer had to worry about their gender, race, appearance or even location, for they could escape into a virtual world where all of these attributes were infinitely mutable.

This was, in other words, the return of *simulation* to the fore, presuming not only that thought can be detached from the materiality of the bodies within which it is usually contained, but that thought actually operates more effectively (in a more 'pure' manner) when residing in this form. 'The notion of ideal Forms in early Platonism has the allure of a perfect dream,' notes Heim (1993: 89), but 'the ancient dream remained airy, a landscape of genera and generalities, until the hardware of information retrieval came to support the mind's quest for knowledge'. Once again, the material realm is denigrated as being just another kind of simulation or illusion, one that can be replaced by technical means with another, more liberating form of simulation. So many of these internet pioneers appeared to imagine the internet as akin to the Bishop Berkeley's view of the universe – a collection of minds linked together, with no necessary corporeality – while at the same time totally eliding the very much necessary material and technical architectures that supported such ventures, as well as the user's continued embodiment even while participating in this virtual world. It went basically unquestioned that online identity was an entirely voluntary form of performance – the internet was presented as a kind

of global masquerade, a stage or theatre in which individuals could freely adopt the characteristics of whatever idealized social role they wanted.

Interestingly, the feeling of empowerment that motivated so many users in the early days did not last long. As the internet has gradually transformed itself into a necessary part of our everyday lives, the nature of identity as performed on it has changed as well. Today, the discourse surrounding online identity betrays a profound anxiety. No longer can we rely upon the veil of anonymity, for years of lawsuits, behaviour tracking and targeted advertising have shown that it was little more than a comforting illusion. We should be acutely aware of our presence online; constantly worrying about our privacy; concerned as to what we are sharing with friends, families, corporations, governments and potential employers. The perceived separation between one's online and offline life, which was so vital in encouraging the sense that one could escape the latter, has largely been erased as we experience the continued incursion of digital media in an innumerable variety of forms into our everyday existence. The dream of the internet as a site of transcendence seems to have faded, but the question now is the extent to which the basic hylomorphic privileging of thought (and now information) over matter continues.

Part I summary

The word 'medium', in its most literal sense, simply means the middle, something in between. Media do not merely exist in their own right; rather they connect, they transport, they transform. Whether we are speaking of relations between people, or relations between things, we are speaking of processes of mediation. 'There is', as Serres (1982: 63) writes, 'always a mediate, a middle, an intermediary.' Described in the broadest possible terms, media studies, then, is precisely the examination and elucidation of this middle. In one respect, this is quite a banal observation and tells us little concrete about the object of study in a field that has never been especially well defined or demarcated. Yet does not this lack of clear definition, the amorphousness of a discipline that constantly traverses and transgresses disciplinary boundaries, in itself indicate precisely the profound importance of the middle to media studies? This is a discipline that sits indeterminably between the humanities and the social sciences, between an engagement with the creative industries and a critique of their influence, between numerous media objects – newspapers, film, television, video, computing, gaming, through to broader historical ecologies – all of which refract a multiplicity of perspectives on the world, between an affirmation of media determinism and a determination to transcend such impediments, between media *as they are* and what media *could be*.

Philosophers, on the other hand, have always tended to fear the middle, for it is these mediators that threaten the precision and certitude that philosophy has traditionally sought out. The presence of media, in whatever guise they might take, acts as a constant reminder that for any concept, any proposition, there will always be something outside of it, a parasitic supplement that compromises the philosopher's quest for an ideal truth, unsullied by any such mediation. Philosophy has thus so often tried to ignore or even erase such media. This, argues Derrida (1981: 131), is 'the inaugural gesture of "logic" itself, of good "sense"

insofar as it accords with the self-identity of *that which is*: being is what it is, the outside is outside and the inside inside'. What makes media so troubling is that they complicate any such schema, undermining the self-sufficiency of any metaphysical claim. In short, media form a necessary condition for the ideality of thought, but they also ensure the impossibility of actually achieving such purity.

Over the past six chapters we have attempted to illustrate some of the ways in which philosophers (especially in earlier eras, from the ancient Greeks through to the early modern period) grappled with issues that we still deal with today in media studies: the potentially deleterious effects of new media upon a populace (and especially upon students), as exemplified by Plato's unease regarding the role of writing in philosophy; the question of mass communication and its power to enable and embolden protest; the problem of objectivity, and the extent to which we are able to adequately represent an external reality (presuming that such a thing exists in the first place); our increasing reliance upon automated information processing, and the ways in which this alters our conception of the world and our place within it; and finally, anxieties relating to materiality and the metaphysical fantasy of transcending the confines of the physical world. In each of these cases, we witness a certain apprehension relating to the ways that media are implicated in, and in some cases seemingly undermine, the philosophical premises being put forward, even when it is evident that such media have played a crucial role in the creation of such philosophy.

We must remember that philosophical ideas and concepts do not simply exist in a vacuum, nor do they reside eternally within or above the world, awaiting the philosopher who will discover them; on the contrary, these concepts are not only created within a socio-cultural milieu that is enormously determinative in regard to their final form, but reliant upon media in order to store and transmit them, ensuring that they do not merely dissipate as if into the ether. After all, we only know of Socrates and his ideas today because his students decided to write them down. This is why the general fact that 'communications technologies themselves are documented to a far lesser extent, or are far less accessible, than their contents' (Kittler 1996) is particularly pertinent and problematic in relation to philosophy, for these modes of transmission are crucial to the manner in which we philosophize and yet are so frequently elided. The point to be taken from this is not that we should spurn philosophy, but that the philosophical tradition (for all its bombast), may never be able to quite live up to the claims

that it so often puts forward; perhaps philosophy can learn as much from the study of media as those who study media can learn from it. Just as importantly, though, in examining these various problems, we can remind ourselves that many of the issues and concerns that we encounter when examining the structures and effects of media are not new at all and are in fact grounded in this very philosophical tradition that so often neglects the question of mediation entirely. It is precisely this broader historical perspective that enables us to gain a certain level of critical distance from the present moment (wherein we tend to be blinded to the effects of the media that surround us), and to perhaps assert some autonomy in relation to our state of affairs – to recognize both the contingency of our circumstances and its commonality with prior media landscapes.

We come now to the second part of the book. In it we trace the trajectory of the development of media technologies and the processes of mediation to where the logic of the first part of the book ineluctably points: towards a postmodern world of machine media and mediation that is dominated by network computing. This world contains a logic buried deeply inside what we call 'digitality' – a culture that is formed and expressed, for reasons of capitalist 'efficiency', upon an ever-increasing acceleration and automation. The process of mediation in this context is becoming more and more self-contained. That is to say, the culture of digitality is less a humanly created culture than it is a computer-created and network-created one. We produce and consume within this digitality; and it seems we are destined to live and die inside the culture it creates for us. The transformation has not been total and our domination by computer systems is likewise incomplete. Nonetheless, the power of digitized systems lies in the fact that they, in the main, appear as no threat to us. We welcome every new advance in processing power, every new convenient and 'efficient' app and the unending procession of networkable devices and gadgets that are purported to make our lives better.

However, by accepting networked computers so avidly we risk becoming blind to what has been a fundamental transformation in the shift from analogue to digital technologies. As we will show, this change is more than technological. By investing so deeply in the 'magic' of the digital, we obscure what the ancient relationship with analogue technologies actually means. Importantly, by investing so much in *automation* in particular we abrogate much of the agency that non-digital technologies afforded. In other words, as computer automation begins to

fulfil its immanent promise of autonomy, we adapt to a computer-made reality instead of creating it ourselves. It was Marx in the *Grundrisse* who gave one of his many philosophical insights into the nature of the machine culture of industrialization when he argued that automated production causes Man to 'step to the side' of the production process – there to be alienated from the 'the process of nature, transformed into an industrial process' (1993: 705). And as we shall see in Part II, Marx's vision writ large in our post-industrial society means that digital media and mediation take on powerful dimensions that compromise our capacity to live in a world made by ourselves and fashioned by ourselves in sustainable and ethical ways.

Part II

THE NEW AGE OF DIGITAL REASON

7 Analogue and digital

So soon after the 2011 magnitude-9 Tōhoku earthquake which triggered the tsunami that inundated much of northeast Japan, killing almost 16,000 people, destroying many towns and villages and causing the meltdown of three nuclear reactors at the Fukushima plant, you might have thought that John L. Hennessey would have chosen his words more carefully. In an interview with the *New Yorker* in the spring of 2012, the President of Stanford University confidently forecast that 'there's a tsunami coming' (Auletta 2012: n.p.n.). Hennessey – computer scientist and known by some as the 'godfather of Silicon Valley' – was not thinking of another unstoppable natural catastrophe, but of an equally irresistible 'digital tsunami'. And this was to be activated by the very human forces of Stanford itself as the 'intellectual nexus of the information economy', joining forces with assorted venture capitalists to transform university teaching and learning through computerization (Auletta 2012: n.p.n.).

The inexorable wave referred to was MOOCs (massive open online courses), which use the internet to create virtual classrooms to augment (if not replace) the face-to-face method of pedagogy that predates the university itself. As with almost everything connected with the process of computerization these days, the trope of 'efficiency' is offered as a powerful rationale and is almost always taken for granted to be an automatic outcome. Mainstream media reporting on the wider MOOCs revolution, beyond Stanford, to include universities across the world, was fairly uniform in its axiomatic conflation of computing with improvement. For example, *The Economist* magazine lauded the combination of microchips and markets as a way to shake-up a purportedly out-of-date and inefficient institution. Substituting a lecture hall with a video link to a computer, the magazine mused, is both flexible and cost-effective because: 'Real-life lectures have no pause, rewind (or fast-forward) buttons; MOOCs let students learn at their

own pace, typically with short, engaging videos, modeled on the hugely successful online lecturettes pioneered by TED, a non-profit organizer of upmarket mindfests' (Economist 2012: n.p.n.).

MOOCs have yet to fully realize any potential they may possess and, like Jeff Bezos' Amazon.com, might someday become immensely profitable if their promoters hold their nerve and persist in the belief that computers are a solution in search of a problem. The fact is that in yet another realm of life the computer is seen to be almost preternaturally able to colonize a process, an institution and a culture, with no apparent loss of fidelity to what it is to be human. Indeed, and as we saw in Part I, computers have been seen by influential theorists and philosophers as machines to improve us. As post-war 'human–computer symbiosis' guru J. C. R. Licklider maintained – computers are good at what humans are bad at; and so, having invented them, we can't do without them if we are to progress as a species (1960: 4–11). The computerization of everyday life has been the real revolution (of which MOOCs are only a subroutine), and our largely unconsidered acceptance of them as tools of efficiency and as enhancers of our ontological make-up is what allows the process to continue.

Paradoxically, however, ubiquitous computing also allows the unique opportunity to discover something about ourselves as a species – which is that we are indelibly *analogue* creatures. For the first time in the long history of our relationship with tools and machines we have a radically different technology (the computer) based upon a radically different logic (digital) whose use and influence is so widespread and powerful that we can consider the concept that we are analogue creatures because *we now have something to philosophically contrast and compare it with*. In other words, before our societies became networked it made no sense to think of ourselves as analogue, because there was no ontological basis for it to be considered a problem or issue to think about in a concrete, everyday way. Now we do. And as we will show in this chapter, and in Part II more generally, by unreflectively throwing our lot in with computer logic, a logic that is fundamentally incompatible with what we are, and by falling into line with the logic of machine culture taken to its digital conclusions – humanity has made a gigantic *category error*. Moreover, we have come so far in so short a time in our journey with computers it is by no means clear how we might easily resolve this error and its myriad effects.

A different question concerning technology

To obtain a deeper insight into the human relationship with analogue and digital technologies, it is necessary to consider what modern philosophy has to tell us about the nature of technology *per se*. A central text in this respect is Martin Heidegger's 'The Question Concerning Technology', which he published in German in 1954. Drawing upon Aristotle's and Plato's ideas of causality, Heidegger sought to illuminate what he deemed to be the 'essence of technology' (1977: 3). He wanted to think beyond 'what everyone knows', which is the idea that technology is a means to a human end, a 'contrivance or […] an *instrumentum*' (p. 4). Heidegger argued technology to be a way of 'bringing forth' a form of truth and a way of knowing the reality of the world. 'Technology is a way of revealing', as he puts it (p. 4). However, through *modern* technology, by which he means the technology that has resulted from mathematical-based modern science, humans are now confronted by what he calls a 'challenging' (p. 6). Here, knowing through technology comprises the challenging of nature by humans and the challenging of humans by technology. And in the case of modern technology this, for Heidegger, is problematic. As Peter-Paul Verbeek puts it in his book *What Things Do*, Heidegger understands technology as a particular manner of approaching reality, a 'dominating and controlling one in which reality can only appear as raw material to be manipulated' (2005: 10). Heidegger's principal concern, as Verbeek argues, lies with uncovering 'the technological relationship of human beings to the world' (ibid.).

Much of the thrust of Heidegger's arguments in respect of what Feenberg termed 'the catastrophe of technology' (Feenberg 2005: 88) is useful and helps to understand aspects of the dependency relationship humans have with technological forms. However, Heidegger's essay does not take us to the actual 'essence of technology' as he claims. Heidegger's 'essence' lies at the realm of the 'relationship'; it does not take us to where the actual essence resides – which is contained in the answer to the question: 'why did humans begin to use and develop technology in the first place?'.

Arnold Gehlen, in his book *Man in the Age of Technology* (1980), attempts to give a more functional response to this probably unanswerable question: functional in that it relies just as much upon anthropology as it does philosophy in order to give insight into why we took to tool use in ways that distinguish us from every other species. And functional, as we will show, in that it enables us to think more deeply about the nature of the developmental logic of technology that

has brought us to the computer age. This will allow us to see ourselves (for the first time) as irreducibly analogue creatures that are alienated by the digital trajectory in ways that the Heideggerian perspective does not reveal. Gehlen was a contemporary of Heidegger. Both philosophers share a certain notoriety in that they thrived in the institutions of higher education under the Nazis, an achievement that was not possible without substantial ethical compromises. This should be stated openly at the outset. Academic hand wringing over Heidegger's safe years under National Socialism has a long history. Gehlen joined the Nazi Party in 1933 as soon as they came to power and kept his card current until the very end of the war, after which he underwent a 'de-Nazification' process before he could resume teaching. None of this should be forgotten. Nonetheless their writing on technology illuminates a rich German perspective based upon a 'philosophical anthropology' that situates humans in the context of the natural world – including their relationships with technology.

Gehlen's work on technology and anthropology draws on the nineteenth-century theories of Ernst Kapp, primarily his 1877 book *Grundlinien einer Philosophie der Technik* (*Principles of a Philosophy of Technology*). In this book Kapp argues that technologies need to be understood as improvements or 'projections' of human organs, where 'the appropriate form of a tool can only be derived from the [human] organ' (Brey 2000: 3). In this, Kapp and Gehlen presage the media philosophy of Marshall McLuhan (1964) and his view of technologies as 'extensions' that was hugely influential in the Anglosphere. However, Gehlen adds to this idea by arguing that humans took up technology use in this way – or to use anthropological language, adapted to technology use – and an ultimate dependency upon even the most basic tools because our species could not survive without technological support. For Gehlen, humans are born 'unfinished' (1980: xi) in two fundamental ways. One is expressed in the dependency relationship itself, which goes back to the very origins of our evolutionary drift as *Homo sapiens*. At one level the idea of dependency is uncontroversial. We are born helpless but nonetheless our ancestors were able to thrive and colonize almost the entire planet. We did this because we adapted positively to tool use and we were able to make our dependency work, not only for the survival of the species, but also for its rise to dominance. But there's more to it than that. Gehlen argues that we are born 'unfinished' in another way – with an evolved state

of congenital unpreparedness for life and for survival in nature as a source of *information*. He argues that we are born with an 'instinctual deficiency' where the animal drive for survival *through instinct* is underdeveloped in humans compared with other species (1980: 2). This leaves us prone to a devastating sensory overload because we cannot automatically filter out unnecessary stimuli – all the information that surrounds us that is not directly relevant to our survival. Jonny Thakkar has analysed Gehlen's work and argues that our instinctual deprivation would cause

> an unbearable cognitive overload […] were it not for our habits and routines; these substitute for instincts by reducing the world's intrinsic complexity, enabling us to see what is salient in a given situation and freeing us from the burden of continual decision making.
>
> (2010: 2)

Habits and routines and increasing proficiency with technology development (from hunter–gatherer to more settled forms of agriculture, which increased the need for technology and sharpened further the focus on our cognitive filter) were also the means through which humans could create 'higher' forms of society in which they were eventually able to create the social relationships, institutions and power-relationships that would result in the rise of human civilizations. And as Thakkar continues, 'if these institutions should collapse we would lose our mooring. *We would* (again) *be at sea in a storm of information*' (ibid.) (emphasis added).

As we shall see, Gehlen gives insight into the core essence of technology (why we came to it and what its use did for us) and how the processes of technology use are profoundly linked to nature and the immediate environment in which humans found themselves and drew upon to create their technologies. A key element of this for our own time, and additional to the idea of our propensity to sensory overload, is that technology was analogous to nature; that is to say, technology was analogue in that at some level it had an equivalence in nature that could be recognized. The flint blade, one of the earliest human tools, for example, has correspondence with the claw or tooth of a contemporaneous feline predator – both kill and cut. Until the rise to domination of digital computing, human technologies were almost wholly analogue – as was the species that created them. It is only in our own time that we are in a position to recognize this.

Being analogue

To begin to think of ourselves as analogue means moving beyond our commonplace understanding of what the term 'analogue' means. Usually it is connected to technology such as 'analogue recording' or 'analogue telephones' or 'analogue television'. Those meanings that relate the term to humans are more interesting. For example, the *OED* defines it as: 'a person or thing seen as comparable to another', derived from the Greek *analogon*, meaning 'proportionate' or 'equivalent'. By taking this 'human' approach and adapting it to the work of computer theorist Charles Petzold, Silvia Estévez makes a valuable contribution to the question and opens up a fraction of what is potentially a very rich seam of thought for our computer age. Estévez argues that in fundamental contrast to the digital environment that increasingly shapes our lives, we humans are in fact analogue beings. Pre-digital technologies were analogue also in that they were 'equivalent' to the organic, unfolding and durational processes of humans and their environments and – in a key phrase – are those 'whose operations simulated processes that people had seen in nature and in the functioning of their own bodies' (2009: 401). Her argument draws from Husserlian phenomenology, where moments of time are moments of the experience of duration and where each moment, each present, is implicated in the past and the future. Estévez looks to literature to express this point and quotes from Ellen Ullman's novel *The Bug*, which attempts to understand our analogue struggle with digital machines:

> The machine seemed to understand time and space, but it didn't, not as we do. We are analogue, fluid, swimming in a flowing sea of events, where one moment contains the next, *is* the next, since the notion of the 'moment' itself is the illusion.
>
> (Estévez 2009: 402)

Analogue expression has always been a fundamental mode with which we act upon the world. Indeed the first computers were analogue, with the very earliest that still survives, the Antikythera Machine from 100 BCE, being modelled upon the recognized movements of the stars and the planets. Industrial-age machines that shaped the modern world were 'equivalent' to nature also in that the automobile, for example, was a reflection of the horse, or the steam engine replicated the power of a bullock, or the aeroplane was mirrored

in nature by the bird and so on. Estévez goes on to note that such epoch-defining machines as automobiles, steam engines and aeroplanes express human–machine 'activity [that] crosses time and space in a visible way that allows us to grasp the link between a movement and its effect, the process, the continuity' (Estévez 2009: 402–3). Digital machines are different. Computers do not function like any other machine that has equivalence in nature. And as analogue beings that use digital machines, we are in fact disconnected from their processes. We become distanced because 'we cannot see the continuity of movement crossing space and time to produce an effect [because] they [computers] do not function like something we can recognize in nature […]' (Estévez 2009: 402). Digital logic is possibly unique in its non-equivalence to nature. In quantum mechanics, for example, at the subatomic realm of natural existence, matter is proven to function at the 'superposition' scale where, in contrast to the binary on–off language of the digital, it functions as both on and off at the same time. This superposition, as physicists tell us, is one of 'fluidity' and 'flow' – states that are antithetical to mathematico-digital inflexibility.

Digital technology *denies us* what it is to be tool-using creatures – to be in *dynamic* connection with technology and the ecology from which we emerge. The earliest technologies, such as cutting tools, spearheads and so on, were drawn from the immediate natural environment in order to extend or amplify human physical and cognitive capacity. As noted above, McLuhan brought this idea to the fore *vis-à-vis* media studies (1964). Gehlen developed this idea of extension more as dialectic between humans and nature, which he termed the 'circle of action' (*handlungskreis*) (1980: 14), which expressed our ancient adaptation to tool use and its equivalence with nature. An important difference in these perspectives is that whereas McLuhan saw the tool 'extension' as being of the senses, where any analogue 'equivalence' does not feature as important, both Kapp and (especially) Gehlen saw the latter as vital and an irreducible link to nature, any loss of which constitutes a loss of human integrity and agency.

We will speak to Gehlen's ideas throughout this and subsequent chapters. However, to continue with the present focus on analogue and digital, we can say that, for much of human history, Gehlen's circle of action was maintained in respect to our relationship with technology and nature and its analogue connection. From the stone axe to

the book to the combustion engine and to the aeroplane, although these technologies increased exponentially in complexity and power, they still had their equivalents in nature and we could recognize their effects (also growingly complex) in the world. In the modern period, it is with the advent of electricity, and later electronics, that analogue equivalency began to stretch the circle of action and human recognition towards breaking point. The centrally important *temporal* element of our analogue world is likewise only now, in our digital age, coming to be seen as problematic. For aeons, the rhythms of human life corresponded also to those of nature. Human time reckoning, similarly, tracked to the cycles and patterns of nature – and, as an effect of this, culture did too, creating what Evans-Pritchard termed 'ecological' and 'structural' time (1940: 189). But as civilization approached modernity, time became technologized through the invention of the clock. The clock is of course analogue and is modelled on the recurring cycles of day and night. However, the clock also *distanced* humans from natural time reckoning, by ordering and mathematizing (and laying the basis for *digitizing*) an ancient human interaction with nature. Much more distancing was to come.

Mechanical clock time had only minimal social impact as an invention in Europe from the time of its introduction in the 1300s. It was only with Renaissance and the rise of capitalism that clocks and clock time were to come into their own. Modernity (the converging of capitalism and Enlightenment) became possible only because the rhythm of the clock enabled a rational, predictable, plannable and coordinatable world. However, until very nearly our own time, modernity and capitalism and the Enlightenment worldview itself were all predominately analogue, because there was no alternative logic, no alternative basis for technological invention and development. Straws drifted in the wind, of course, with Leibniz's pivotal invention of binary logic in the seventeenth century feeding directly into the invention, a century later, of Jacquard's loom, which introduced an incipient automaticity into the production process, partially removing the human from work, straining the circle of action, in that part of the process was now outside of it and automatic and therefore not something any longer recognizable in nature. Charles Babbage's nineteenth-century work on the Analytical Engine (still mechanical) and his dream of the 'automation of reason' (Bullock 2008) would later link back to Leibniz through Alan Turing's conception of the 'universal machine' in the 1930s to create the blueprint for electronic digital computing. Turing's invention is seen

almost universally as a positive development and the man himself is routinely described as some kind of genius. But this has occluded any serious investigation into the nature of digitality and its compatibility and/or equivalence to human analogue capacities – and thus enabled the catastrophic category error to be committed. All this took time, albeit relatively short in historical terms. It was in the 1980s that we experienced the global convergence of capital and computing, markets and microchips. And it was through this momentous conjunction that digital computers moved from being machines peripheral to the needs of industrial society, to machines that began to destroy that society in its analogue form.

Being digital

In his 1995 book *Being Digital*, Nicholas Negroponte, founder of the MIT Media Lab, argued that we were entering a new age where 'atoms' (analogue processes and analogue humans) would fuse with digital 'bits' to create a superefficient information-based world. This would be the widespread operation of 'smart computing', machines that 'know' us and will 'understand individuals with the same degree of subtlety (or more than) we can expect from other human beings today' (1995: 165). It's not known whether he would have envisioned quite the same kind of 'understanding' through the surveillance society that we do have today with the domination of 'our' data by corporations and governments; this may indeed be 'subtle' but whether it is empowering of individuals is debatable. As a futurist Negroponte has been proven correct in that, as far as our immersion in networked life goes, we *are* becoming more enmeshed in the digital and 'each generation will become more digital than the preceding one' (1995: 231). Assumptions sometimes come true. However, *Being Digital*'s most egregious assumption (one widely shared then and now) is that all analogue processes and analogue humans (though he does not describe humans in this way) are always improved by computerization.

For businesses, from the 1950s onwards, there was never any need for reflection regarding the appropriateness of digital logic. Out of public sight and awareness, giant mainframe computers hummed, throbbed and processed the routine informational flows of corporations with immense efficiency and cost savings; it was the same in manufacturing, albeit more visibly and at a slower pace of actual implementation, as automation tended to cut production-line jobs, such as in car plants. However, to make computing acceptable in the lives of people, to make

it a central part of everyday life, meant that they had to be very different looking from room-sized boxes with flashing lights. They needed to *have the look* of analogue and have seeming equivalences in nature enough for us to 'grasp' as Estévez put it, the process and its ostensible continuity. Key to enabling mass computing was the graphical user interface (GUI), 'the point at which humans and computers meet' (Estévez 2009: 402). The extent of the simplification of computing through skeuomorphic icons such as the filing cabinet or the compass or the dustbin; terms (and graphics) for incredibly complex processes such as 'windows' or 'net' or 'web'; and hardware and software innovations such as touchscreens, mouse-pads and voice-activation are all oriented to make digital logic appear analogous to humans ('user friendly'). Such simplification, it may be argued, is a form of infantilization and helps explain why children are often magnetized towards the colours and graphics and apparent naturalness of a tablet computer and its contents.

Digital applications and innovation are typically driven not by the quest to satisfy human needs, but to satisfy an exigent capitalism – albeit overlaid with a design-driven, Apple-esque patina of constructed human needs. It's not enough that computers 'reach out to the environment […]' as Robert MacBride presciently put it in his book *The Automated State* (1967: 4). We need to *want them* and feel that we can recognize and amplify our analogue essence through them. But in the early days of the computer revolution in the late 1990s, even this apparent symbiosis was not enough and the Internet Age was nearly stillborn. The dot.com crash occurred in 2000 not because people began to shun computers, but because networked computers were not fulfilling their fundamental requirement – to make profits for business. The internet was overblown at this stage by a level of hyperbole that reflected investors' and start-ups' belief in their own propaganda regarding what was actually possible for business. Still in its infancy, the internet was too underdeveloped. It was slow and expensive, and not enough businesses were internet active beyond static and lacklustre webpages. People were connecting in growing numbers, but not enough were connecting to where it mattered – to businesses with products and services to sell. Most crucially the internet was not interactive enough. That is to say, people were too distant from digital capitalism; the internet though digital was still at this early phase too human, too analogue for it to realize what Bill Gates termed 'friction free capitalism' (1996) where buyers and sellers find each other efficiently, directly and by dint of the ongoing and stupendous advances in algorithmic software – *automatically*.

People were using the internet at this time in their growing millions, but did so to communicate with *each other* in text-based communications, such as bulletin board systems (BBSs) and email (Hotmail, for example, thrived in the dot.com crash), where the cash nexus did not dominate. Users might not even participate interactively at all but simply 'surf' the internet's not-so-rolling waves armed with idle curiosity instead of a credit card. There were indeed many human relationships in this first public iteration of the internet, a proto-social media, you could say, but they were not of the right kind for business. A still analogue-inflected internet where analogue-raised people explored on their own terms and in contexts they could at least partially recognize, was simply too messy, too unpredictable and unknowable in terms of business's capacity to shape and manipulate their presence towards commerce, or the intention to buy. People themselves were as yet too unaffected by a fuller interactivity where buyers' wants and needs could be predicted and created and shaped and suggested through a shifting of the weight of affordance from that of analogue users to automatic and algorithmic digital systems. This is where Web 2.0 came in.

Web 2.0 is a logic (and also a trademark, which hints at its provenance) that rescued the internet and the wider digital society from potential obscurity or niche-status to become a fast-moving, fast-developing and highly dynamic global network that includes, to at least some extent, a goodly portion of humanity, with 40 per cent internet access worldwide and over 70 per cent having mobile phone access. The term was promoted by tech entrepreneur Tim O'Reilly after the 'Web 2.0 Conference' in 2004 as a way to sell an idea – a new business model – that would bring bits and atoms much closer together in ways that would make businesses profitable. Although described by O'Reilly as a 'new architecture for participation' (2005), Web 2.0 did not involve any radical technical innovation. As Evgeny Morozov (2013) describes it, the rise of Web 2.0 was instead the effect of an 'conceptual imperialism' by Silicon Valley and its free market fundamentalists in order to change ideas around 'open source' software; a 'rebranding' of what software did and what it enabled *vis-à-vis* the user and the web.

The transformation from 1990s minimal interactivity and sluggish speeds to twenty-first century in-your-face, instant gratification has been breathtaking. In little more than a decade Web 2.0 has made possible a fully commercial and commercially successful internet where hundreds of millions of ordinary users can purchase, review, research, renew and share almost anything. And they do. So-called e-commerce booms all around the world, creating corporate behemoths such as

eBay, Amazon, Alibaba and many others, which pose an existential threat for bricks-and-mortar (analogue) forms of business, from high street shoe shops to trendy quarter bookshops. Derivative of this explosion in digital capitalism has been social media (although social media are often seen by theorists such as danah boyd (2014: 19) as a form of digital life that is allowing youth especially to develop positive and 'innovative strategies' in order to traverse perennial adolescent problems). Boyd, it should be noted, is also employed by Microsoft. Nonetheless, there would be no social media platforms – the ostensibly 'free' platforms delivered by Facebook, countless blog building software, Twitter, Weibo and so on – without the online buying boom that provoked the vast migration of advertising money to the internet and triggered a similarly dire existential threat for analogue media such as the newspapers that depended upon printed ads. Social media have been an unanticipated, but convenient, opportunity for Web 2.0 to close the embrace between analogue and digital ever more tightly with the bonds of (digital) commerce.

Tim O'Reilly argues that social media should more properly be termed 'pull media', because they constitute the 'social revolution [that] allows people to consume what they want, when they want, and largely on the recommendation of friends and other non-professional influencers' (2012a). This is partly true. But it is not the whole story and certainly not 'largely' so. 'Pull media' theory, for example, does not account for the need for the ineluctable 'push' of advertising, and the hugely complicated (and secret) algorithmic techniques employed by social media companies to profile their users, to target them individually and precisely and more powerfully for advertising. Neither does it account for the powerful psychology of advertising that from the theory and practice of Edward Bernays in the early twentieth century onwards has had a hold over mass consumer culture through the media construction of wants. We see this in the mass cult around Apple products, which are more expensive than those of their competitors, but have the prestige of design, a simpler interface and the self-styled *je ne sais quoi* of the Apple brand.

Prophets and loss

Nicholas Negroponte was nothing if not passionate in his prophesying. At the conclusion of *Being Digital* he emphatically proclaims the book's essentially political *raison d'être*:

> While politicians struggle with the baggage of history, a new generation is emerging from the digital landscape free of many of the old prejudices. These kids are released from the limitation of geographic proximity as the sole basis of friendship, collaboration, play, and neighborhood. Digital technology can be a natural force drawing people into a greater world harmony.
>
> (1995: 230)

The absence of the 'economic' from this digital landscape is revealing in its own way, and indicative of the assumptions regarding computers for business and the lack of reflection in allowing them in the name of business efficiency to colonize more and more registers of life. We will return to Negroponte's vision at the end of this chapter.

There is reflective literature regarding our digital landscape, much of it insightful, but much of it also lacking a critique of the digital takeover of a historical human-technological analogue reality. Typical here is Michael Harris's evocatively titled *End of Absence*: *Reclaiming What We've Lost in a World of Constant Connection* (2014). His plausible and common-enough thesis is that, through our increasingly intensive and extensive networked connections, we are losing the capacity for old-fashioned sociality. We see something similar (and more empirically based) in Sherry Turkle's *Alone Together* (2011). Nonetheless, Harris usefully draws the popular readership to the idea that digital connectivity overrides, through its intensity and immediacy, the interstices and latencies involved in analogue communication. While he shows the totalizing and colonizing logic of computing he does not (cannot?) show the genesis of this logic in a neoliberal capitalism, the capitalism of 'light touch' corporate regulation and the insertion of the 'market mechanism' into growing realms of society.

Harris even makes a case for the loss of an analogue way of life, although he does not venture beyond a journalistic accounting of it in a chapter entitled 'Analog August', where he diarizes each day of that month when he abjured any digital connection: 'hello 1987' he writes in the first entry (2014: 178–209). This disappointing superficiality was reinforced by the book's publisher, Penguin, who ran a parallel marketing wheeze titled 'take a vacation to 1983' where, upon purchase of the book, and disconnection for a weekend, five titles from the Penguin list were given for free. The four-year difference in the nostalgic year in the 1980s was not explained. What was made clear, though, as with almost all such advice for resisting the lure of the digital, is that it is essentially *your problem*, a case of individual responsibility, like the libertarian

worldview concerning smoking or obesity or gambling (e.g. Anderson 2009). The shallow appreciation of the problem only masks an underlying ideological malaise. Harris's efforts are doubtless honourable. He identifies a profound problem that isn't a formal *non sequitur* (the lack of 'absence'). However, by placing the onus on the individual, and by eliding the logic of capital, Harris, along with so many others, seems to have internalized the ideology of neoliberalism, an ideology of market and microchip that sees no essential problem with networked capitalism and no negative link from this to the everyday lives of people. Ironically, it is a link that many at the libertarian spearhead of digital capitalism in Silicon Valley *do* see. This was evidenced in the *New York Times* in a report on the trend among employees at Apple, Google, Hewlett Packard and others to send their children to the decidedly analogue Waldorf Schools, which have no computers whatsoever, and advise against them even at home. They do this because, according to a teacher interviewed for the piece: 'Teaching is a human experience' (Richtel 2011).

Underneath Harris's appraisal is an actual *lack* of absence in all our lives, one that goes far beyond simple connectivity. Absences are the messy times and spaces of analogue life, the interstices and latencies that comprise the times and spaces of synchronicity, of randomness, of the 'right' time of *kairos* or the 'wrong' time of what McKenzie Wark terms (in reference to Nietzsche and Deleuze) the 'untimely' (2001: 1), where unpredictability and creativity exist alongside the possibilities of blandness and disaster. These are the times and spaces of reflection and serendipity, of impulse and consideration. They are zones, as James Gleick (1999: 10) argues, that are vanishing because the 'absence' that they formed as part of analogue life is being occupied by the digital logic and the efficiency-oriented acceleration in social relations that it brings. These are the times and spaces that we often didn't know existed, or we took for granted. With their occupation by network time and virtual space, these absences become corrupted, become less habitable, become endangered.

If these spaces and times of absence are taken so much for granted that their loss or colonization by the digital is hardly registered in our lives, why might they nonetheless be important? In concluding this chapter, we offer two examples, one seemingly trivial, the other rather more weighty and portentous. Both are instances where colonization of analogue processes by digital logic seems to have proceeded

largely unnoticed, but they carry social, cultural, economic and political consequences that we still have fully to reckon with.

The first does indeed seem innocuous. It is the industry standardization, in 1983, of the Musical Instrument Digital Interface (MIDI) file. MIDI technology now largely determines how we compose, play and listen to music. As with all digital applications, its rationale was based on instrumental efficiency. A whole song, for example, can be coded in a few hundred lines of programming, and the file can be endlessly and cheaply replicated and distributed. All good? Well, no. Music is fundamental to all human cultures and therefore central to what it is to be human. Both music and humans have always been analogue. But as Jaron Lanier, musicologist and an engineer at the forefront of digital technology innovation in the 1980s, has noted: 'Before MIDI, a musical note was a bottomless idea that transcended absolute definition […]. After MIDI a musical note was no longer just an idea, but a rigid mandatory structure […]' (2010: 9). MIDI strips recorded sound back to its digital minimum, where noise and mistakes and anything unexpected is taken out. The notes become 'clean' and the music, if one accepts the opinion of many audiophiles, becomes 'sterile' and 'cold' if compared with the analogue recording. Because it is fast, cheap and 'efficient' MIDI technology has become entrenched. It is locked-in as the basis for recording and playing music the world over and nothing can reverse this, because, as Lanier laments, it would be 'impractical to change or dispose of all that software and hardware' (p. 7).

The colonization of music signifies more than subjective appreciation of its sonic qualities, and signifies even more than the colonization of a cornerstone of human culture. MIDI technology shows how *time is colonized* and how the potentialities in the absences within the phenomenological experience of time are claimed for the digital and for the immediacy that it enables. As listeners, hundreds of millions, if not billions, of us regularly incorporate music into our network lives, using iPods, smartphones, listening to music on internet platforms, on MP3 players, and collecting and buying legally or illegally from a growing range of network sources. This is taken for granted and is massively popular at the same time – and it is all rendered as digitized data. Edmund Husserl in his *The Phenomenology of Internal Time Consciousness* (1964) uses the example of listening to music as a way to understand the experience of temporal duration. Music is an extended and implicated durational experience. Listening to music is (or can be) one of Harris's 'absences', times of potential latency and

reflection, where the experience of listening can produce powerful states of thinking. These may be sustained to a more or less degree, to where more refined thought can rise up, to where emotion may be generated, and to where insights may be produced and where the unexpected can emerge.

Analogue listening has these affordances. To engage with music analogically creates its own actions and reactions. It takes will and conscious effort to get up from a chair to stop or begin playing an analogue disc; with an MP3 player, both decision-making and effect are instantaneous, often sub-conscious, and may be readily made to be automatic. We can shuffle, listen to a few seconds of a song, scrub-scroll through it and switch from genre to genre and much more, all with only the movement of the thumb. Smartphones converge radio and video to the same immediate digital horizon. Digital listening (and viewing) thus tends towards the present as opposed to the extended horizon; and time is not only colonized and flattened, but accelerated also. The personal digital machine cancels the personal absences of analogue-life potential. It squeezes the time needed to attain an ontological stability in the world that Gehlen's circle of action, with a technology of equivalence, enables. To move through beginning, middle and end of a 'long player' disc – now a niche and exotic technology – is to experience, in a small but representationally useful and important way, a form of duration, a form of *narrative history*, that the digital device is not conceived or built to replicate.

Our second example merely extrapolates the point to consider the loss of analogue more broadly – as the sum of all the realms of life now affected (and connected) by the computer. Living in a postmodern age is usually seen in cultural terms as an age of pastiche or depthlessness or simulacra. Often too it is viewed as having economic underpinnings, and evidenced in the new dominant mode of production, post-Fordism (see Harvey 1989). There are useful perspectives here and they do signify deep social, cultural and economic transformation since the 1970s. However, these also suggest, at least implicitly, a kind of 'passing through', an analogue journey (still) into a (usually) more dystopic future. What the arguments in the chapter and throughout this book suggest is that we are no longer on a journey towards or through modernity. We are *losing* the past and the heritages of modernity (the good and the bad) and the journey to the future has *stopped*. In a world of digital that we cannot recognize in nature, in a world where spaces and times of duration are colonized, and where accelerating digital

speed and network time displaces the time of the clock and generates social life more and more on the basis of a 'constant present' (Purser 2002: 160) we lose the flow of time, clock based and subjective. We lose, in short, the sense of history, itself irreducibly analogue, where each moment, each era, is implicated in the previous and in the next. Fredric Jameson argues something similar: our 'postmodern generations are dispossessed (without even knowing it) of any differential sense of that deep time the first moderns sought to inscribe in their writing' (2003: 699). Without the 'deep time' sense that the 'first moderns' wrote into the ideas that made modernity possible and (for good or ill) a project that unfolds in time and space, we become cast adrift, infantilized by the digital and (as we shall see in Chapter 10) increasingly politically helpless.

Negroponte's declaration of hope for a digital future begins to look like an ironic disjuncture in our ahistorical digital present and expressive of our collective category error. His political vision has no substance, nothing that clings to the physical world and its analogue essence. To 'discard the baggage of history', as he advocates the young to do, would be to simply do that – discard history. And this is precisely what living in a digital present affords. It is to live in a political world where the past is either not available for enough of us to reach to it for its lessons, or is seen as irrelevant to us in the present, or we have no time to reflect upon it even if we wanted to, so rapidly do events leap up at us. The near-meltdown of the global economy in 2008 was a close-run thing. But little or no lessons were learnt and the economy stayed the same in its essential logic, despite the lessons of history being still available to policy-makers. John Berger identified the problem of the helplessness of postmodern politics as early as 1991: 'Post-modernism has cut off the present from all futures. The daily media adds to this by cutting off the past. Which means that critical opinion is often orphaned in the present' (p. 149).

'Geographic proximity' in Negroponte's world is seen as a social straightjacket. Networks of connection, he maintains, release the individual into a global network of diversity and possibility. The opposite turns out to be the case. As Sherry Turkle argues '[digital] technology offers us substitutes for connecting with each other face-to-face' (2011: 22). And we do, because the digital's affordances 'speak to our vulnerabilities'; the potential stresses and strains of the fleshly and analogue world may be more easily avoided, and so we are 'free' to spend long hours 'socializing' in front of a screen (p. 230). Contiguity is an

analogue state. We more readily recognize nearness in distance and, politically speaking, we feel solidarity more in nearness too. With proximity is the potential for collective action, whereas networks afford only 'loose ties' that are linked by invisible bonds of data streams where 'commitment' is at best tenuous because the presence of a face (or faces), which Emmanuel Levinas argued to be 'an irreducible relation' and the basis for a binding moral bond, is absent, or is virtual, and therefore not easily recognized – and so nor is the concomitant feeling of responsibility that may come with it (1969: 80).

Last in Negroponte's exceptionally revealing three short sentences of his conclusion is the expressed faith in the 'natural' power of the digital to promote a kind of world peace. Perhaps Negroponte is out on a limb here, as this is not quite the kind of political hope we find expressed by theorists and activists today. Relatively modest (yet still quite radical) claims for 'network activism' are more common. Manuel Castells, for example, foresees a 'rhizomatic revolution' in the digital age where social media release grassroots political potential, the 'roots of a new life spreading everywhere […] moving and networking, keeping the energy flowing, waiting for the spring' (2012: 144). The words are inspiring, romantic – and analogue. This is the modern political process migrated to the digital sphere. However, the conflation of analogue and digital as a kind of natural progress is shot-through with the same assumptions that Negroponte makes. And the immediacy of social network politics is its fatal manifestation. 'Efficient' communication between thousands of activists can fill streets and squares, surprising (and sometimes toppling) governments, police and soldiers, and 'democracy' seems to be at work. However, with immediate communication the spaces and times of political history and commitment are either missing (overridden), or have had not enough time to develop sufficiently to have political traction. The 2011 Arab Spring (doubtless the 'spring' that echoes in Castells' raptures) showed how network politics is no match for old-style analogue politics over the mid- to longer-term (Hassan 2012). Any chance for 'harmony' in the Middle East was quickly dashed as the retrograde politics of Arab history reasserted to cataclysmic effect, particularly in Syria.

As a society we have paid too little regard to the possible consequences of having let loose a technology, the computer, which is unlike any other. Jay Bolter (1984: 8–12) recognized some time ago that computers were special. They not only incorporate and transform analogue

machines and processes – and render obsolete those that resist – but they also create whole new fields of processes and labour and connection, with the amorphous internet being the obvious example. As an enabling technology, the computer is also (under the command of capital logic) a colonizing one. We cannot easily escape its demanding logic, and its networks of connection thicken and traverse the planet. Moreover, the computer that we have on our laps and in our pocket may be a device that we purchase and we own, but what makes it possible and functional and part of our lives does not belong to us; it's private, it belongs to business, to shareholders, to capitalism, and capitalism brings its own logic and that of the computer into almost every waking moment. The computer is all this. The computer dominates like no other technology has ever dominated and it is difficult to see how it could ever be obsoleted, so adaptable and enabling and directing is it. The electronic computer that we are so dependent on today is also digital. And we are not.

8 Technological determinism

Social science fiction?

In this chapter we argue for the idea that networked computer technology effectuates a real and delimiting form of determinism. That is to say, intensive and extensive computer networks that pervade our lives shape and 'determine' those lives in ways that *would not occur* either at all, or to the extent that they do, in the absence of computers in such networked abundance. We are at the beginning of this process, but the digital 'category error' that we made in the post-war period, and implemented under the market guise of 'efficiency' in the 1970s, has blinded us to the negative effect of the digital upon the analogue. This has made any serious scholarship on the subject of technological determinism easy to dismiss as the stuff of sci-fi movies or books. We don't argue that an army of HAL-type computers is emerging to outsmart and enslave us. Nor do we suggest that analogue is 'good' and digital is 'bad' in any comprehensive and prescriptive sense. We do argue that computers change fundamentally the *human–technology relationship*. We have always been dependent upon technology for our survival, but the relationship was one where humans had an active role. With computers the dependency has increased, but our function is no longer so active; it is more passive – and where computers lead (and they do lead in highly specific directions), we tend to follow.

In the social sciences in particular, to refer to the work of someone as being 'technologically determinist' is often enough on its own to confine the work (and its author) to the margins of seriousness, as the paranoia of a Luddite, or as an embarrassing, insufficiently nuanced articulation of the complexities of modern life. Beyond the fixing of the appellation, nothing more usually needs to be said. The noun 'determinism' can be especially damning, betraying a seemingly rigid mindset on the part of the author, someone relentlessly dour and whose politics, if not personality, probably verge on the authoritarian. Referring to

computing technologies in particular, theorists in the social shaping of technology (SST) discipline such as Judy Wajcman argue instead for an analytical stress upon the more dominant and interesting *human qualities* such as autonomy, diversity and potential (and avoiding any hint of pessimism) as a 'richer' approach that would best 'highlight this mutual shaping relationship' between humans and information technologies (2010: 143, 150). By definition, then, to be a 'determinist' is to exhibit a 'poverty of philosophy' as Marx put it in another context, and to be one-dimensional in respect of the inexhaustible and irrepressible potential in the human–technological path towards progress.

It has to be said that many of the works that do stress the power of information technologies as decisive in determining the lives of individuals and societies often do their case no good by *over*-determining it. We see this in the 'dromological' work of Paul Virilio who, although rightly celebrated for his philosophical exuberance, often pushes his central analysis of the effects of speed to the boundary. For example, his 1995 essay on the temporal nature of cyberspace, although prescient in many respects, lapses often into what Wajcman (2008) has criticized as 'social science fiction' when he states that 'what lies ahead' in our relationship with computers is a 'mental concussion' due to their growing accelerative and informational effects upon our lives. As just noted, Virilio's work is full of insight, but it is equally crowded by sweeping claims and assertions that go badly with the more sober-minded sections of the scholarly community, especially many SST advocates.

If Virilio can sometimes get ahead of himself, others (in fear of the academic ducking stool, perhaps) can hedge or equivocate and thus weaken (by paradoxically over-determining) their argument as a consequence. We see this in Wolfgang Hofkirchner, emissary of the so-called 'Salzburg Approach':

> The spread of ICTs brings about a change in the very sphere of using and creating technology. Technology itself changes. By coupling with the computer which mechanizes certain abilities of the human brain the machine of the industrial age which only mechanized abilities of the human body turns into an automaton.
>
> (2007: 32)

This short passage actually articulates two useful points, which echo (though far too strongly) the concerns we raised in the previous chapters: that machines and bodies, and computers and society, represent

two distinct technological phases in our modernity and postmodernity. However, Hofkirchner sees these simply as cumulative technological disasters, resulting in the human finally becoming 'an automaton'. This kind of technological determinism leaves humanity (and theory) with nowhere to go, because if we were already automatonic, then there would be no way of resolving the problem of human freedom anyway. We don't argue that determinism drives us all either to 'mental concussion' or to spend life as 'an automaton'. Computer logic and its networking emerges from, and still works in conjunction with, earlier analogue forms of technology. The key point is not so much specific 'effects', which is rather like seeking specific effects of global warming, which is difficult if not impossible, but the human–technology relationship itself and how we are to understand it. Only if we appreciate the nature of the relationship are we more able to gauge the effects upon humans and whether or not determination takes place.

First we should say some more about the SST approach that dominates these questions in the social sciences. The idea of 'mutuality' or 'social shaping' is central to the SST critique and began to be developed in the mid-1980s when the emergence of mass-consumer computing provoked a fresh questioning of the human–technology relationship (e.g. Bijker *et al.* 1987). Judy Wajcman takes this connection up most directly, and more recently, when she re-emphasises the SST position that 'technological change is a contingent and heterogeneous process in which technology and society are mutually constituted' (2007: 293). This is on the face of it a fairly reasonable statement. But as a precept it would be useful (and more acceptable) if as an element of 'mutuality' there were examples that show that sometimes technology can constitute society in a negative way, in a way that could even be described as determining of it. Logically, one would think, the example and outcome of a negative process would enhance the power of the positive argument. The point about a good deal of SST and related work is that one confronts difficulty in finding a critique of discrete technology or systems of technology. Mutuality is often stated, but it is always the human who does the shaping, who dominates the process, and eventually achieves the ends that are positive for humans, thereby proving their individual and social mastery over technology (e.g. Green 2002).

This is anthropocentrism, or humanism, at its most academically seductive. Yes, they say, there are problems with the technological society and harmful effects may come from some technologies that are poorly or instrumentally designed. But in an ironic echo of

Tim O'Reilly's advocating of 'collective intelligence shaping' through Web 2.0 (2012b), much SST research in effect argues that individuals and society will reject the bad technologies and reshape those with potential in ways that are more positive. This is a humanism freely proclaimed by theorists such as Wajcman (2007: 289) and she is blurbed for it in praise of her more recent work (2014). The problem with humanism, however, is its species-arrogance and its roots in the Christian and Enlightenment worldview that places humans at the top of the ecological pile (and apart from that pile in terms of ontological classification). Humanism and the technology relationship have more recent and consequential pedigrees in the dogmas of twentieth-century communism and the environmental catastrophes in the USSR and China; this is to say nothing of liberal-capitalism's record in this respect. The philosopher John Gray is one who seeks to draw our attention to the need to see our *actual* place in the biosphere we share. In *Straw Dogs* he writes that:

> Humans think they are free, conscious beings, when in truth they are deluded animals. […] Their religions are attempts to be rid of a freedom they have never possessed. In the twentieth century, the utopias of Right and Left served the same function. Today, when politics is unconvincing even as entertainment, science has taken on the role of mankind's deliverer.
>
> (2002: 120)

Indeed one does not need to be so philosophical about the cause and effect of twenty-first century humanism and its confidence in science and technology. We see a Christian- and Enlightenment-derived ideology that finds consonance with the more workaday thinking of Silicon Valley in technocratic libertarianism. Computers serve human purposes, it is argued; humans also make computers 'smart' in order to serve our needs. But this libertarianism goes further, towards a kind of democracy via the marketplace where smart users, bug-fixers and ordinary users will go on to change or fine-tune and smooth out the rough edges of the code or the application. Determination doesn't come into this view, because there are people who make and there are markets and users who shape and improve. Being naturally superior to the technologies we produce and having social institutions such as the market to oversee this domination means that either technologies will be rejected or they will be shaped in ways that suit us better.

What exactly gives us this power is never discussed, but implicitly it seems that it is a creative mix of humanism and market-forces, and where the needs of society will find a way to prevail over any incipient determinisms in technology. Again, implicitly at least, humans are special and our creation of tools and the shape that we collectively give them contribute to human evolution or 'gradual change' which in the SST sense invariably means 'human progress' (Mackenzie & Wajcman 1985: 10). We saw a good example of this as a typology in the previous chapter in danah boyd, whose research sees kids making and shaping social media to help them in their lives; but she also sits at the supply-side of the technology equation by working for Microsoft.

Automation and the broken circle of action

The mutuality (which is in fact an anthropocentric humanism) that SST sees as its ground zero for the human–technology relationship elides a deeper-seated problem with computer technology. Previously we touched on the idea that humans are actually *dependent* upon technology – a relationship that goes back to the very origin of our evolutionary drift as *Homo sapiens*.

The key to this dynamic relationship as we also saw is Gehlen's concept of the 'circle of action'. This allows us to theorize the human–technology relationship and it enables us to render as problematic our current relationship with the specific logic and capacities of computers. Gehlen's circle of action enabled humans to ameliorate the state of dependency into one that is more truly mutual – albeit in a constantly provisional way that cannot efface our deep-down dependency. For Gehlen, the circle of action is what enabled humans to engage with the world and create the technologically derived reality by means of 'facilitation', or the augmenting of our physical and cognitive capacities through technique (1980: 18). Reflecting on this Robert John wrote that:

> The 'circle of action', or the ability to monitor the effects of our actions and change our actions in order to achieve the desired results, compensates for the lack of an immediate harmonious relationship with the environment. Because human existence is characterised by the 'open-endedness of arrangements' (Gehlen, 1980: 33) humans seek to achieve a stable ordered existence.
>
> (1981: 106)

The achieving of desired results, however, has a cost, and this entails the progressive narrowing, through technological development, of the 'open-endedness of arrangements' that would be the optimal state for the functioning of the circle of action. To express ourselves through the labour we expend in technology use is, for Gehlen, to at least partly objectify that labour, and therefore to diminish a corresponding part of human subjectivity, the realm where our autonomy and freedom may potentially reside. Moreover, our active monitoring role of checking and balancing the effects of our technology development and use is also lessened because the objectified functions and effects of the labour-technology process reside 'out there' in the world where we have less control, individually or collectively, over them. This 'objectification' process is progressive and historically has produced three distinct relationships between humans and technology and, as a direct consequence, humans and nature. Gehlen (1980: 19) writes of the relationship:

> In the first, that of the *tool*, the physical energy necessary for labour and the required intellectual input still depended upon the subject. In the second, that of the *machine*, physical energy becomes objectified by means of technique. Finally, in the third stage, that of *automata*, technical means make dispensable input from the subject.

Gehlen argues that our 'fascination with automatisms is a prerational and transpractical impulse, which previously, for millennia, found expression in magic' (p. 14). In other words the orientation towards automation is a rudimentary human trait and is expressed through our 'tendency toward facilitation' – or the augmentation of human power through technique and the subsequent relief from demanding physical and cognitive effort that technique enables (p. 18). One could deduce from this that we are fundamentally indolent, constantly looking for ways to make life easier. But another way to think about it is that to automate is also to be able to wield a certain power in nature (and over nature). And so, functioning as a kind of 'magic', automation touches that impulse that Gehlen speaks of, where machines secure our position of supremacy in nature – the one that SST continually revalidates – and where automation grows and improves to become the fullest expression of human power (Ashworth 1996). This perspective is reflected in the broad social attitude to computing which many see as a solution to every problem. But what we miss in this confidence, both in ourselves and technology, is that the more we make

processes automatic, the more we actually exclude ourselves from the circle of action and, as a consequence, the more deeply automaticity severs the link from us to technology and nature.

The concept of automation that has fired the imagination as a kind of magical power has been with us since classical antiquity. It still resides deep in the cultural psyche. As Arthur C. Clarke wrote a generation ago: 'Any sufficiently advanced technology is indistinguishable from magic' (1973: 21). And capitalism, from the time of Jacquard and his loom, has pursued the automation of its productive forces with implacable zeal. This followed the realization (beginning at least with Adam Smith (Aspromourgos 2012: 483)) that it would be a certain path to profitability through 'efficiency', where faster means cheaper and taking the human 'out of the loop' – a telling computer science phrase that is very apposite to our argument – as the optimal way to achieve this. Historically, the arguments against automation have always resided at the economic level of capitalism itself – concerns about the elimination of jobs and the extinction of skills – and not as an assault upon the fundamental human–technology relationship. However, to see computing and automation in the way we argue enables the realization that the subject has become incredibly vulnerable – a susceptibility that grows in proportion to the scale and ubiquity of these processes in our world. Automated computing, we must remember, is no longer primarily engineered for the processing for us of the dull and routine administrative tasks that were its 1960s *raison d'être*. In our Web 2.0 postmodernity, computing is engineered precisely to *not* leave us alone, somewhere safely out of the loop, but to *exploit* that susceptible isolation, to 'reach out' to us as Robert MacBride noted (1967: 4), and to persistently 'speak to our vulnerabilities' as Sherry Turkle added (2011: 230) because computing is oriented almost wholly towards the needs of capitalism.

In summary: We have always been dependent upon technology. *Something like* mutuality occurred in Gehlen's circle of action where, in the earliest phase of our species' emergence as tool-using creatures, a tentative stability in the relationship could be said to have existed. However, as machines began to create the basis for our modern world, they also diminished our role by objectifying the human labour power that was a key element of the technology relationship. Machines of increasing precision and power also made capitalism possible, and the dialectic began to change from that between human and technology to that between technology and efficiency. With automation emerging

as the inevitable outcome of capitalist competition in commodity production, the loop within which we began our ancient journey with technology closes to us still further. Today it is our vulnerability to automated networked systems, an autonomous logic and system that cannot ignore us, that places us at the threshold of what might be more properly termed *network determinism*. This is a postmodern form of technological determinism in that it feels so natural that it appears that we express our free will in our networked lives. But this principally is the power of automation. It is the exercise of 'magic' upon 'facilitation'. It is a force that has a kind of awing quality, so much so that it seems to *effortlessly* come to us, effacing, seemingly, our dependency (because it's now automatic). Moreover, it enhances the feeling that *we must be* shaping this network to our needs and wants, because *we* are the users and it does not feel like we are being forced (much) into anything – so how can it be 'determining'?

Network determinism: accept cookies?

In November 1994 Microsoft launched a global advertising campaign titled 'Where do you want to go today?' for its new Windows software. Microsoft was then at the forefront of the massification of personal computers and it was also at the forefront of the hyperbole that was beginning to fuel a tech bubble that would pop a few years hence. Their flagship ad, still viewable on YouTube and elsewhere online, looks dull and clunky today, but the intent then was to inspire a sense of global freedom for the user where the world was opening up to all kinds of new experience, virtual places and virtual people for you to discover, with Microsoft supplying the digital vehicle to take you there. The choice is yours. As we saw earlier, however, around 1994 choices were in fact very limited. Connection speeds were slow and unreliable, and the software itself was not quite sure what its point was: was it a business tool, was it for research or was it for fun? Users were working it out for themselves at this still analogue-inflected stage, and doing it in ways that left the internet start-up companies that helped inflate the bubble spectacularly wrong about where they thought people might actually want to go. The late twentieth-century network was unable to determine very much.

Post-crash, twenty-first-century Web 2.0, however, was able to answer the question that Microsoft posed, and the answer was not a multiple-choice one but a *pre-determined* (or default) answer, which was that the user had to go in the direction of the digital marketplace,

to businesses with goods and services to sell, and for 'content' to be created by millions of users from whom businesses could either buy or appropriate; it was either that, or they could not have a cheap and fast and ubiquitous network at all (Fuchs 2014: 51–65). Disingenuously or not, Microsoft was asking the wrong question in 1994. By providing the new determinedly business orientation, Web 2.0 asked the only question and provided the only possible answer. The new internet fundamentally shifted the orientation of users' experience. What many called 'true interactivity' was in fact a networked capitalism coming for you. The ideological manoeuvre was critical and it was camouflaged as 'efficiency' and 'connectivity' and simplicity itself; and with the burgeoning of social media and the app economy as unanticipated consequences, a dense commercial interactivity of goods and services – and ready credit for millions – had never been so close and so easy. The new internet seemed to open up all kinds of possibility. A key objective for making the internet work second time around was, as Tim O'Reilly and John Battelle (2009) put it, 'once-difficult tasks become automated'. Once this had spread far enough (and it still spreads every day) then a certain deterministic logic began to assert itself. Automated digital networks now had the capacity to conceive, signpost and direct where we 'go' in our networked lives. But is this really 'determinism' and, if so, what kind is it?

In an essay titled 'A Life Lived in Media', Mark Deuze *et al.* proffer an answer, one that is avowedly determinist, though not exactly in the sense that we mean. They write: 'media […] make us lose ourselves […] in our technology to the extent that it generates our lives on the basis of a specific set of rules, codes and protocols' (2012: 2). What this suggests is a process of pre-programmed automaticity; having our analogue essence coded, being *ourselves programmed* and fashioned as automatons in the manner of Hofkirchner's Salzburg determinism. Again, this is to over-determine determinism and so neglect the changes in the human–technology relationship that is at the heart of what network determinism is able to enact in us. We are not and could never foreseeably be autonomic – this *is* science fiction. Our analogue essence lies in our relation to nature; it is biological, not digital, and although it is certainly suppressible it is ultimately ineradicable. What is to be done? As Bruno Latour suggests, we must think and act 'beyond the dichotomies of man and nature, subject and object, modes of production and the environment' (2004: 1). The aim, which is a *political* one, is to break through those dichotomies that are

artificially reinforced by networked automation and that leave us vulnerable and growingly isolated ('alone together' in Turkle's excellent description).

The political dimension of the network society is to us a key one, and in Chapter 10 we discuss in some detail the travails of the political in our digital age. For now it may be insightful to bring the *shaping of the political subject* within the neoliberal and networked context to the fore – and to consider the effects of the new power of digital technologies over networked lives. A central principle of both classic liberalism and neoliberalism is the autonomy of the individual. During the 1980s British Prime Minister Margaret Thatcher spearheaded the neoliberal revolution at the popular-political level. For Thatcher, society was ideally comprised of 'individual men and women, and […] families' acting as the very bedrock of the free society. She was also fond of thinking of politics at the 'household level' as she termed it, where in the home political economy merged with the moral economy, to produce the liberal individual as the basic unit of society. A concomitant of this is that of privacy – the right of the free individual to be left alone by the state. However, as Hannah Arendt, quoted in Dawes (2014), has argued, the classical liberal conceptions of privacy, of autonomy and individuality, are abstractions that serve to separate people from public life (the *polis* or *res publica*) and from other individuals. The term 'privacy', she reminds us, 'meant literally being deprived of something' (Arendt, cited in Dawes 2014: 32). The private realm where a person was able to be authentically individual was, since the time of the Romans, intended only to be a 'temporary refuge from the business of *res publica*' (ibid.). Modern notions of privacy, she notes (writing in 1958), had become 'sharply opposed to the social realm' (ibid.). Extending Arendt's thesis to our postmodern age, the more individual we become, and the more we fetishize the concepts of privacy, then the more we withdraw from, or are drawn away from, an active and participatory political life. With the supposed naturalness of people wishing to follow their own interests first, we find a corresponding individualism and a sanctification of the private sphere that finds its postmodern articulation in neoliberal globalization. To the extent that these abstractions actually exist they constitute an autonomous individualism made possible by information technologies. Arendt's theory of 'deprivation' is useful for those who would seek a disconnected and pliant citizenry. To anaesthetize this deprivation with the ideology of 'individualism', together with the easements of the consumer society, and the legislated 'protection' of our private online data, is not only to

create weaker political subjects, but also – as lone users gazing into a screen – to increase our vulnerability to networked computing.

For the generation of the 1980s and 1990s the introduction of computing to the workplace was a *fait accompli*. Not many then demanded email, or queued to learn new-fangled applications, or suggested that workplace-connected computers be allowed to colonize the privacy of their home. It was a sign of our collective political weakness that our digital future contained so little popular involvement. We went along with it and soon we couldn't imagine life without computers. As in so many other realms the needs of business trumped any social and cultural considerations. A political 'lack' that merged with a growing technological 'lack' brought about by automation, ensured that our exposure to the logic of digital capitalism left the 'individual' at a clear disadvantage.

The determinism of the network is not primarily a particularization of the effect of computers, but rather a *generalized orientation* towards commercialism and the widening sphere of digital capitalism. It is an orientation towards infantilization by apps that fill our non-working time with mindlessness or frustration; an orientation towards a life spent 'naturally' as a consumer or client or user; an orientation towards the expectation of an immediacy in all things digitally generated, an expectation that would have been unimaginable (and often morally and ethically questionable) in our analogue world; an orientation towards the cash nexus that shadows every connection and every relationship; an orientation towards advertising everywhere we look, and advertising itself being a natural and taken-for-granted presence in all realms of network life and beyond. These are broad orientations that describe aspects of a network-determining life and are by no means exhaustive. Examples continue to proliferate in proportion to the growth and sophistication of a network engineered to serve commodity production, both informational and traditional.

The 1994 Microsoft slogan 'Where do you want to go today?' did, after a fashion, and with lip service or not, 'exalt' the consumer as an individual who has choices to make and the agency to make them. Today Apple Inc., now the most powerful and profitable seller of computer products, feels no such obligation. In 2011 the slogan for one of its flagship products, iCloud, where the user can remotely store data from their computer, was: 'This is the cloud the way it should be: automatic and effortless.' Gone is any perceived need to blandish the user about freedom and choice. Indeed, with the further separation

of the user from his or her work and life, any concept of digital life as a kind of open-ended journey or unfolding project is no longer worthy of consideration or even pretence. This is because there is no longer any need to tempt users to the network – we do not have a choice. What is promoted is simply 'efficiency' in life and in business, and there's hardly any difference between these any more. We must all be 'efficient' and, even though we cannot recognize its analogue in nature, iCloud, despite its name, we must take on trust as a vague kind of magic provided to help us. It's automatic and it's effortless and therefore, as the history of our relationship with technology since Jacquard's loom shows, it must therefore be progress and it must therefore be good.

The network determines us in particular ways too, though these are even more subtle, even more psychological, and their growing complexity and finesse act as the *ultimately determining tools* that are the Holy Grail for those like O'Reilly who see capitalism and people as finding their quintessence only in the networked computer. Much has been written recently about algorithmic computing. Eli Pariser caused a small storm in internet circles in 2010 with his book *The Filter Bubble*. In it he showed how Google's algorithmic software monitors user behaviour through more than 50 different digital sensors to build a profile of the user's wants, needs, interests, patterns of buying and so on – this number has doubtlessly increased. It is the user profile that enables Google to exist; it constitutes the value that it attracts advertisers with. Pariser's experiments showed that Google's search engines tailor their suggestions in response to all queries, including those that have political aspects. He showed, for example, that if a user's search pattern indicates she has left-leaning (as profiled by the algorithm) views and interests, Google will 'personalize' her search results to show sites that would fit with her political profile. This has obvious consequences for the necessary unfettered exposure to a diversity of political opinion that is the basis of the democratic process. However, techno-enthusiasts, and even those more sceptical theorists, like to argue that Google actually provides a useful service; making use of an otherwise chaotic internet and its clever algorithms are able to give you what you want, like and expect. What Google calls 'personalization', no matter the extent of it – and this has been debated in the wake of Pariser's book by theorists such as Jonathan Zittrain (see Weisberg 2011) – constitutes a form of determinism. The individual as user is cut out of the decision-making process and it is the

algorithm that 'anticipates' the user, creating what Cass Sunstein had earlier identified as the 'echo-chamber effect' (2001). This is where, in your daily information diet in politics, in news, in arts and entertainment, etc., there will be fewer surprises, less to upset or unnerve or to take one outside one's comfort zone, or to give cause to reflect upon a subject or an issue through exposure to differing perspectives or arguments. This is determinism because the worldview becomes inevitably narrowed. It does so not *becaus*e of any political conspiracy or market ideology, but as an unintended *effect* of pervasive automation oriented towards market efficiency. It does so through a network model dominated by commercial imperatives that determine that any other outcome in the filtering process of information production and consumption is highly unlikely because, to be itself 'efficient', the network and its advertising needs specifically to target *you*.

What we describe as networked determinism thus becomes the sum of our postmodern vulnerabilities. Living inside the network we are outside the growingly automated circle of action where our labour, our sociality and our political practices become objectified and commodified. Immersed and isolated in ubiquitous automation we make relatively easy subjects (and targets) for determination. This is not to be automated according to the 'codes and protocols' of computers, but to follow where these codes and protocols lead: to be oriented in our billions to the commodified virtual spaces on network capitalism that were unimaginable to most of us even a decade ago. To argue that this greatest ever migration of humanity to the same places for largely the same reasons is a form of 'mutual constitution' in our relationship with technology is itself a kind of science fiction, a particularly unimaginative kind at that, which says nothing about the potential of humans or technologies beyond the banalities of a digital capitalism whose logic is singular and is rendering us and our technological futures singular as well.

We are not automata. We have, however, been left isolated and exposed to a logic that is antithetical to our analogue essence. Automation denies us our ancient and active role with technology and the mutualistic dimensions of 'facilitation' that enabled our survival as a species and, more, the ability to create cultures, civilizations and, since the eighteenth century, forms of modernity which lasted until only recently. This determinism is more like a form of oppression, because its root causes lie in political choices made in the 1970s and 1980s to solve economic crises. Political choices to solve economic

problems brought computers from the university and military labs to the masses. It is therefore to politics that we must look for solutions to the oppression of automation. Media and politics will take up a good deal of the rest of the book. In Chapter 10 we will consider their digitally derived problematic in the context of democracy as being essentially a modern and analogue process in a postmodern and digital world. In the final chapter we will focus these broad arguments to questions of *temporality* and *ethics* to show how and why we must reconnect with the dynamics of technological development and of the natural world that formed the human–technology relationship that has become estranged.

But to continue: the nature of our transformed politics is central if we as individuals as part of a polity wish to find the keys to unlock our digital cage. But politics is communication, and communication through technology, as we saw in Chapter 1, is mediation. And networked digital communication as the means of expressing ourselves as active and positive political beings, as this chapter would suggest, is difficult. Nonetheless, to enable us to think more clearly about remedies for the postmodern political malaise, we need first to consider the digitally derived symptoms of our *global media society*.

9 Global media society

Can we speak of a 'digital dialectic'?

We begin by positing the question: 'can dialectical thinking lead to any insights into our network society, and, if so, what can they tell us about the nature and function of media in that society?' The Platonic dialectic touched upon in Part I of this book proceeded through the dialogue of reasoned argument oriented towards the search for truth. Here we take up the new life given to the dialectical process of the Classical conception that emerged through Hegel, who argued in terms of a dialectic of social change where 'everything is inherently contradictory' in society (1969: 439). In this view it is the effect of the tensions emanating from these contradictions that give society (and history) its motive force, moving it forward, always seeking resolutions to its own contradictions, but creating only more contradictions in the process. In particular, we take up the critique of Hegel's thought by Theodor Adorno and the Frankfurt School, which conceived the dialectic more as a materially derived process. In contrast to Hegel, they viewed it more negatively and critically in relation to the workings and logic of capitalist modernity: a dialectic, in other words, that is the modality for the 'study of the immediate cultural, economic and political life-worlds of "Western democracies"' (Vouros 2014: 174).

Why use the dialectic? In many ways, the waning of the dialectical approach, or 'critical theory', which we will sketch in outline soon, paralleled the weakening of the influence of the Frankfurt School which gave power to this modern approach through sophisticated neo-Marxist critique in economics, culture, politics and so on. There was no particular 'moment' when this happened. This decline and fall was drawn-out and its battlefields were not in the streets but in the university seminar rooms and in academic journals and books. If we need to periodize, then it is possible to say that the eclipse of the dialectical approach to analyse society occurred with the rise of

poststructuralism in the 1970s. In questions concerning politics, or power and resistance especially, the influence of Michel Foucault has been immense and his rejection of the dialectic was explicit. Referring at the end of that decade to the process of political struggle in his book *Power/Knowledge*, Foucault argued that: '[…] one must try to think of struggle and its forms, objectives, means and processes in terms of a logic free of the sterilizing constraints of the dialectic' (1980: 143–4). Gilles Deleuze has been influential also, albeit in an even more forthrightly register of Nietzschean polemic: '[the dialectic] … is an exhausted force which does not have the strength to affirm its difference, a force which no longer acts but rather reacts to the forces which dominate it' (1986: 9).

The growing ascendancy of the poststructural critique seemed to have had its real-world political validation in the late 1980s. The millions who crowded the streets and squares across Eastern Europe to call for an end to Marxism as they had experienced it displayed some of the contours of a postmodernity that was already underway in the West. This process culminated with the implosion of the Russian centre itself in 1991 and the wholesale turn of the East to the West and to liberal capitalism. Back in the academy these momentous shifts seemed to be given yet more credibility with Francis Fukuyama's 1989 'End of History' essay, which argued that the dialectical historical drive, or what Roy Bhaskar (2008) had termed the 'pulse of freedom', which had motivated both Hegel and Marx (with their different emphases), had come to a halt with the victory of liberal democracy and neoliberal capitalism. Fukuyama was a self-declared conservative. But the eulogies for the dialectic's death came also from the avowedly radical Michael Hardt and Antonio Negri, whose acclaimed *Empire* lamented the fact, as they saw it, that the rise of the postmodern empire meant that the 'dialectic of modernity' had come to an end (2000: 43). Henceforth their methodological approach to the phenomena of empire would be 'nondialectical and immanent' (p. 47). Part of the problem for the dialectical approach, and this was an explicit issue for Hardt and Negri, was that its teleologies of progress, from Hegel towards a unified 'spirit', and from Marx towards a communist utopia, have been, especially in Marx, bankrupted by history itself. Even the non-teleological dialectic, the 'negative dialectic' of Theodor Adorno, they argue, had been outflanked by empire/postmodernity and had 'lost its effectiveness' and become a 'closed parenthesis' (p. 217).

We want to reopen the parentheses placed around Adorno and take a fundamental idea (of identity and equivalence) from his *Negative Dialectics* as our starting position on the 'digital dialectic' before moving to the theme of this chapter, which is the postmodern 'global media society' within which we now live. Ideas of identity and non-identity and the contradictions that attend both phenomena are what enable the dialectic to proceed. Adorno thought that, for most of history, the negative dialectic was dominant, especially so since the Enlightenment. A key phrase in his thinking on this in *Negative Dialectics* is: 'Identity and contradiction in thinking are welded to one another' (1973: 6). A 'non-identity' emerges from this contradiction and so 'to proceed dialectically means to think in contradictions' (Adorno 1973: 144–5). Identity, for Adorno, corresponds to the basic idea of equivalence – the way in which the world is reduced to homogeneous categories of exchange. But equivalence, too, is negative; indeed, it is the core of the negative direction of the dialectic. In *Dialectic of Enlightenment*, Adorno and Horkheimer (1986) contend that equivalence has been the forced blurring of distinctions to impose order and objectify nature. The Baconian scientific method, *una scientia universalis*, was the means though which Enlightenment thinkers obtained 'the schema for the calculability of the world' (1986: 6). What this meant was that 'Bourgeois society is ruled by equivalence. It makes the dissimilar comparable by reducing it to abstract quantities' and that, with the rise to domination of the Enlightenment dialectic 'without regard to distinctions, the world becomes subject to man' (1986: 7). It is, in other words, the distancing from nature, the alienation from it in the most fundamental sense, which is the basis for his negative dialectic.

Much has been written about Adorno's alleged pessimism. It seems – so entrenched has the negative modern world become – that the hinge upon which the dialectic turns could not possibly be angled in another direction. However, at the beginning of *Negative Dialectics* Adorno writes (p. xix):

> *Negative Dialectics* is a phrase that flouts tradition. As early as Plato, dialectics meant to achieve something positive by means of negation; the thought figure of 'negation of negation' later became the succinct term. The book seeks to free dialectics from such affirmative traits without reducing its determinacy.

In other words, and *contra*-Hegel and the more totalizing Marx, we need to reject the idea that the dialectic turns inexorably towards

teleological progress and accept that the concept, for it to be truly useful, must be open and flexible and subject continually to interpretation and revision.

Fredric Jameson's brilliantly forensic reading of *Negative Dialectics* in his *Late Marxism* (1992) has given us a way into Adorno's work for considering the dialectic in media society. Discussing Adorno's concepts of identity and non-identity, and seeking to rescue them from poststructuralism and for Marxism more fully, Jameson draws our attention to 'a passing remark' of Adorno's, which for him is in fact a 'crucial phrase' if we are to understand the context in which to make sense of the negative dialectic. We quote Jameson at some length here as he provides the conceptual links that we wish to make between the operation of the dialectic, the human relationship with technology and nature – and the emergence of global media society:

> The crucial phrase [in Adorno] identifies 'what cannot be subsumed under identity'—that is to say, everything that has been evoked […] variously under the notions of difference and heterogeneity, otherness, the qualitative, the radically new, the corporeal—as 'what is called in Marxian terminology *use-value*' (emphasis added). This is the decisive clue, not merely to the basic philosophical argument that subtends Adorno's conception of identity and non-identity—*Capital*, volume I, Book I, Part I—but also to the ultimate identity of 'identity' itself, which we have observed to take on the forms of psychic identity and of the logic of epistemology before coming to rest (at least provisionally) in the economic realm of exchange and the commodity.
>
> (1992: 23)

So the ultimate identity of identity itself, Jameson tells of Adorno's quest, is to be found in what Marx theorized as 'use-value'. Marx himself characterized this classically and simply (for once) as 'the usefulness of a thing' (1976: 126). Its value, to reverse the line, is in its usefulness. The analytical worth of this, of course, is to realize that if the thing is produced for exchange, then it acquires exchange-value and becomes a commodity. But to stay with use-value for the moment: in the use-value process there exists a non-negative dialectic – a making and using, with one process informing and shaping the other. We see also strong resonance with Gehlen's circle of action where technology is implicated in the use-value creation in a way that Marx does not address, except as the forces of commodity production through exchange-values. However, to view 'use-value' and the circle of action

as commensurate ideas is to see not only the significance in Marx and Jameson, but also their limitations.

To connect Gehlen with Adorno is also to help realize that the dialectic is not negative in the making of use-values; it becomes so only when capitalism intervenes on a large scale to transform labour into the production of exchange-values. Albeit tentative in its construction, the Gehlen–Adorno framework reveals a much deeper problematic than the essentially utopian Marx–Jameson reading of the dialectic. The connection to nature, or the loss of it – revealed through Adorno's idea of 'equivalence', coupled with Gehlen's insistence that by means of automation we not only objectify our labour, but distance ourselves from nature – are both taken to extremes under capitalism. However, these contradictions won't be resolved by capitalism's ending; there is still the Enlightenment legacy, with humanism at its core, with that philosophy's implicit or explicit subjection of nature by man. Any post-capitalist order that does not *explicitly repudiate the concept of humanism* will continue to have it as an inheritance, as a seemingly 'natural' element of living on the face of the Earth. On the margins of political philosophy, much deep ecology thinking, for example, does question the idea of humanism (e.g. Næss 1989) and scatterings of radical green cults, such as the Earth Liberation Front (ELF), take seriously the harm to nature that stems from the humanist perspective. But in terms of plausible political alternatives to humanism (and humanism can take liberal, socialist or even fascist forms) there is nothing remotely capable of challenging the hegemony of this thought at this time. The key point is that this hegemony is connected intimately to our modern relationship with technology, with machines and automation and computing. Calculability, instrumental rationality and efficiency are bound up with Enlightenment humanism and have been turbocharged by capitalism.

If capitalism has powered the humanist and rationalist aspects of Enlightenment thought, then digital logic and applied computing power have taken these to an altogether new level. Here we find a new appreciation of the dialectic, what Peter Lunenfeld terms the 'digital dialectic', which is embraced in the eponymous collection he edited in 2000. The collection is notable for at least three reasons. First, it represents an initial attempt to come to grips with the idea of the dialectic and of critical theory in the context of the new computer age. Second, the collection reflects the thoughts and ideas of influential writers from a diversity of arts and humanities disciplines,

from film theory (Brenda Laurel) and philosophy of technology (N. Katherine Hayles and William J. Mitchell), to philosophy of media (Lev Manovich) and politics (Michael Heim). Third, and most significant, is that the collection represents an early warning that the dialectic in its digital mode might be something rather different, and potential-laden, to the dialectic in its previously *exclusively material and analogue* form. In his Introduction, Lunenfeld sets out the parameters of the digital dialectic that the subsequent essays operate within. Beginning with a reference to Adorno to locate his approach he writes:

> Adorno saw within the dialectic a way to weld together identity and the contradiction of thought, unfolding 'the difference between the particular and the universal'. Capable of indicating two possible states or conditions – '0' or '1' or 'off' or 'on' – the binary mode of cybernetic calculation might appear to resemble this duality, which is, in essence, the dualism of thesis and antithesis. Resemblance is not identity here, however, and *conflating the digital with the dialectic is a mistake*. On the digital frontier, the endless alternation of off/on, a system of closed and open switches, never generates a true synthesis; it merely impels the regeneration of the system. Yet this inability to come to synthesis may be turned to our advantage. It may prevent us from falling prey to a newly devised teleology for the digital age: the techno-utopia that cyberlibertarians promise once markets are unfettered and the world is fully virtualized.
>
> (2000: xviii) (emphasis added)

Lunenfeld and his contributors advise, in essence, that if we proceed with caution and with a critical attitude then all might be well in our relationship with computers. The collection is a relatively early one in our digital age, so he did not make it explicit, nor did he use the term, but he does imply that digital logic may be problematic for our *analogue* nature and our *analogue* history. However, in more positive mode he goes on to say that if we consider the fundamentally important 'relationship between theory and practice' – of which his book is to be an opening contribution – then this particular interaction will provide an ongoing check and balance upon the direction and travel of the digital dialect on into the future (ibid.). The concept of 'practice' is offered in its Marxian understanding, where there is an assumption of co-equivalence with 'theory', travelling in its own dialectical sphere. As we have argued previously, however, the logic of the digital is oriented towards automation, towards where labour becomes ever more objectified, and where 'practice' becomes correspondingly devalued as

a means of acting upon the world (through technology) in any mutualistic sense. And Lunenfeld seems almost to foresee the failure of his project of a digital dialectic that would offer positive outcomes for a networked society through models of critical theory and critical practice that would enable the digital to be turned towards social needs. It comes at the end of his Introduction where he issues a sadly prescient warning concerning the transformation of both our analogue world and our *media world*:

> no matter how much digital systems resemble film or television, they are fundamentally different. The computer, when linked to a network, is unique in the history of technological media: it is the first widely disseminated system that offers users the opportunity to create, distribute, receive and consume audio-visual content with the same box. Thus, theorists have to strive to create new models of commentary that consider more than consumption or spectatorship. These models must take into account such things as the trade-off between speed and immersion, potential in the lab versus viability in the market, the social dynamic of the user group […]. All this and more begin to get at the constraints of practice to these new media.
>
> (2000: xix)

Lunenfeld pins his hopes upon a 'widely disseminated system' that is not wholly oriented towards profit, and that by critically overseeing its evolution through 'new models of commentary', then the transformation to a digital world, a digital dialectic of a more positive kind might be effected. However, neoliberalism was already globally hegemonic by 2000; and as we now know, a few years later, a largely proprietary Web 2.0 emerged to release digital logic from any limits upon profit and exploitation. This in turn meant that Lunenfeld's 'constraints of practice' were already completely unconstrained in their automating, distancing and alienating effects upon users.

Mediation, dialectic and the supremacy of the commodity

It is often overlooked in the ideas and the arguments surrounding the nature of the public sphere that what we are actually speaking of is not simply a civil society sphere, but a *media* sphere and a *technology* sphere. Moreover, the capacity to facilitate information creation and sharing means that these spheres constitute a distinct *dialectical*

movement – one that is a primary mediating factor in giving political and economic shape to modernity.

The concept of the public sphere has been widely influential, across many disciplines in the social sciences as well as the humanities, since the publication in English of Jürgen Habermas's *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*, in 1989. We do not intend to review the many arguments and revisions, historical and ongoing, since the book first appeared. Of significance for us is the idea contained in the subtitle; that is to say it was concerned to identify and theorize the sphere of mediation of *bourgeois society*. As Habermas originally conceived it (1989), and in his revisiting the subject in response to his critics (1992: 421–62), the public sphere was argued to be a class-based phenomenon. The dynamic and mediating sphere belonged to the rising merchant and intellectual class of eighteenth-century Europe. It was an innovative sphere of communication, initially in Britain, where the bourgeoisie could discuss and promote its own interests, using the latest means, intellectual and technological, at its disposal. The point to grasp is that this class *owned* and *developed* the means that set the parameters of the discursive space. Nancy Fraser writes in her critique of Habermas that his 'aim was to identify the conditions that made possible this type of public sphere' (1992: 111). In that vein Régis Debray brings to convergence the aspects of material ownership of the technological means of production with that of the mediation (circulation) of the ideas that gave shape and coherence to a proto-modern political society. He argues that it is '[i]mpossible to grasp the nature of conscious collective life in any epoch without an understanding of the material forms and processes through which its ideas were transmitted – the communication networks that enable thought to have social existence' (2007: 5). Fraser and Debray allude essentially to the same thing – a nascent capitalism, busily creating the 'structural transformations' (to draw emphasis to the title of Habermas's book) through which its political and economic interests would be promoted. This was often in the face of radical counter-interests, of course, but the movement, the dialectic, proved unstoppable as the emergent form of the new bourgeois power.

For Habermas as much as for many other theorists of the public sphere, the idea of *participation*, a sphere where 'everyone had to be able to participate' (Habermas 1989: 37), was viewed as indispensable. If one does not participate then one is functionally excluded. Participation requires access and in the eighteenth century there were two primary

barriers: literacy and the financial means to produce, consume and synthesize the information that circulated within the sphere. Literacy in the general populace was fairly high at 60 per cent in Britain in the mid eighteenth century, but this was basic literacy and more complex ideas in print were impenetrable for the majority (Melton 2001: 81–2). Producers and *elite* consumers were much less numerous but usually much more literate. From the time of Gutenberg, who financed his Enlightenment-promoting invention by (ironically) printing indulgences, publishing was a business where exchange-values immediately eclipsed the use-value of print. And as Robert Darnton (1987) argued, the Enlightenment itself was largely a business. It was elite producers and consumers who were the foremost participants in an *inherently asymmetrical* public sphere. At the centre of the public sphere were those with the tools of information production at their disposal and with the capacity to *use and exchange* what it produced. By enabling 'thought to have social existence' the bourgeoisie were thus equipped to shape the world to mirror their interests through the production and circulation of informational commodities such as newspapers, books, pamphlets and so on. Participation, in a point we will return to, may be described in this period as *limited to an elite but strongly influential*.

Régis Debray categorized this era the 'graphosphere'. This was the sphere of the dominance of analogue reading and writing, a period that ran, he calculated, from '1448 to around 1968: from the Gutenberg revolution to the rise of TV' (2007: 5). This period was not a smooth unfolding of the technologies of writing and publishing and of a growingly democratic consumption of the ideas that emerged from them. By the mid nineteenth to early twentieth century, as societies became more industrialized and developed, and as literacy became yet more widespread and advanced, the business of the graphosphere – of publishing and of commodifying information – became massified, became a different kind of business. Late-Victorian industrialization generated a second structural transformation of the public sphere. In Britain, the foremost industrial power at the time, millions of consumers of daily news began to be exposed to quite a different fare than previously, and the public sphere question of 'participation' would become even more problematic as a consequence.

Shortly before Habermas had coined the term 'public sphere', Raymond Williams, in his 1961 book *The Long Revolution*, considered the late-Victorian public sphere by looking at the growth of the

popular press. He saw this sphere as pivotal for any possibility for a media democracy. Then as now, competition between rival publishers for market share drove technological innovation. Moreover, economic changes in the wake of the depression from 1873 until the middle of the 1890s meant that industrial ownership of publishing began to concentrate and wield tremendous social, economic and political power. With this power came a 'growing desire to organize and where possible to control the market' (1961: 200). Williams goes on to show that as a consequence of this desire 'advertising took on a new importance' (ibid.). Around 1900 saw the beginning of what Williams terms the 'Northcliffe Revolution', named after Lord Northcliffe, the newspaper and publishing mogul. Northcliffe is said to have advised his journalists: 'Never lose your sense of the superficial'; he also is quoted as saying: 'News is what somebody somewhere wants to suppress; all the rest is advertising.' Apocryphal or not, the opinions seemed to express a new public sphere *zeitgeist*. What culture critic Matthew Arnold termed a 'new journalism' was shifting the focus of the reading masses away from any civic-minded consideration of the serious affairs of the day, towards a more vulgarized staple of crime, sex and human interest stories (Williams 1961: 195). However, Williams argued that the trivialization of news in the 'new journalism' thesis was an effect, not the cause. This new structural transformation, he argued, came not from the journalist profession, but from deeper changes within the structures of industrial society. As he phrased it: 'The true "Northcliffe Revolution" is less an innovation in actual journalism than a radical change in the economic basis of newspapers, tied to a new kind of advertising' (p. 202). In this context, where ideas and debates and hard news become subordinate to filling page-space with adverts, the level of literacy becomes less important too. Less important also, needless to say, is the need to construct an intelligent and engaged public sphere. Williams is clear about this, and in a way that has resonance for our internet-dominated global media society:

> Literacy was only a factor in terms of the other changes. […] While it is wise to work for a higher literacy, we shall only arrive at the centre of the matter [the lack of a progressive and democratic public sphere] by asking questions about the social organization of an industrial society, about its economic organization, and about the ways in which its services, such as newspapers, are paid for.
>
> (p. 178)

Habermas was well aware of the corrosive effects of advertising upon the bourgeois public sphere (1991: 181–95). And he saw the space of genuine 'critical-rational reflections' move towards small-circulation journals and periodicals (p. 182). The public sphere itself mutates into a 'medium of advertising' (p. 189) where 'exchange-value is codetermined by the psychological manipulation of advertising' (p. 190). The long phase of mass-media society throughout most of the twentieth century consolidated this process and set the supremacy of analogue commodity media seemingly in stone. However, by the 1990s, the rise of the network society, which Habermas was attuned to early, held out some hope for him for a new public sphere, an emergent global media society, or digital public sphere. In his 1992 'Further Reflections on the Public Sphere', and in language that shows prescience (if not felicity), Habermas views new digital technologies as the 'electronically produced omnipresence of events and of the synchronization of heterochronologies' that profoundly affect 'social self-perception' (1992: 456). Given that the original German publication of the *Structural Transformation of the Public Sphere* appeared in 1962, things had changed greatly on the technology front over 30 years. Radically new communication technologies could mean the freeing up of the role and function of information. In *Reflections*, Habermas thus noted the positive role TV played in the making of the revolutions of Eastern Europe in 1989 and postulates that the 'omnipresence of events' of that year disseminated through an electronic media that has global reach and 'ubiquitous presence' might well 'give cause for a less pessimistic assessment' of what might be possible in the emerging global media society (p. 457). We will return to Habermas shortly.

In this chapter we have sought to view 'global media society' not fundamentally in terms of the standard narratives of concentration of ownership, or of the rise of a digital plutocracy. Nor do we wish to depict it through the counter-narratives of the supposed diversity of political potential through social media (which we will discuss in the following chapter). For us, global media society is a postmodern phenomenon created through our historical and evolving relationship with technology that reflects the logics of a growing alienation of the individual and society from technology that we have discussed throughout this book. Fundamental to this postmodern phase is the migration from analogue to digital media technologies in global media society – and the kinds of politics that are possible (and those that are diminished) as a result of this exodus.

Global media society

To be fair, Habermas was 'not sure' what his more optimistic tone at the very end of his *Reflections* would mean 'for a theory of democracy'. That we would be living in an internet dominated media society in the twenty-first century would have been difficult to foresee in long-ago 1992. It is interesting to note, though, that as critical theorists both Habermas and Lunenfeld still feel able to attach their (qualified) hopes to media *technologies*. For Habermas the vision is of a much more open society, one made possible through a global media available to all. This might create a kind of transparent globality where, as happened for East Germans and Romanians in 1989 when they watched TV news of the unrest across their countries, people lose their fear because they no longer feel alone and vulnerable. For Lunenfeld, the hope in digital computers is an essentially humanist one. For him, as well as for those who participated in his project for the theorization of the digital dialectic, the dialectic turns out to be not only Enlightenment–humanist, but also teleological. Humans created computers, and although he admits that our analogue essence cannot 'synthesize' with computers, this is actually our strength. Because they are alien to us, he implies, we can dominate them and make them do what Enlightenment-derived science constructed them to do – to serve us and to serve 'progress'.

We saw also that Fredric Jameson gave us a way to think about Adorno's negative dialectic in order to keep faith with Marxist intentions (of political freedom and democracy) without adhering to Marxist prognoses (of the building of a communist utopia). The non-identity of the negative dialectic will turn towards its positive, he predicts, once the 'provisional' domination of the realm of commodity logic and exchange-value is over. The key to understanding the travel of the dialectic towards its negative polarity and the key to understanding the dialectic between the media sphere and the technological sphere in the Habermasian public sphere is, as Jameson touches on, the commodity logic and exchange-values. However, this *inner* logic remains untouched today. Indeed it has been strengthened greatly since the 1970s and we need to face the current constitution of global media society with this realization in mind. By banking on the 'provisionality' of capitalism, Jameson radically underestimates the immense power of Enlightenment–capitalism–instrumental rationality. This power's immanent contradictions are what give the negative dialectic its motive force; an 'advancing process but a retrograde one at the same time' (Adorno 1973: 157). The contradictions also make it tremendously fragile – in

the illogic of its economy, in its destructiveness of the human subject and in its attempted subjugation of nature to the abstractions of profit. The political contradiction, at least in respect of its saliency as a site for grand political and historical struggle, has dwindled to irrelevancy. For the first time since the Reformation, which Gutenberg's press made possible, there exist no significant worldviews, no 'systematic rival outlooks within the thought-world of the West' that would challenge the current political hegemony (Anderson 2000: 17).

If Gutenberg's press made the Reformation and the Enlightenment possible, then the technological conditions created by the internet makes almost *impossible* the rival thought-worlds that movable type enabled. This was the realm of *modern* politics: the realm of democracy, of human rights, of the universal franchise, of the debating chamber, the ballot, the committee room, the research department, the conversation in the street, the protesting in the square – it was the realm of analogue communication, Debray's graphosphere. The mutation of this into its technological opposite, the digital sphere of information processing, has served to nullify or at least seriously degrade Gutenberg's legacy. By embracing computers as the means to political freedoms, Habermas and Lunenfeld effectively rely on the use of a technology that is antithetical to the public sphere and antithetical to the critical–political (analogue) attitude that is able to exploit the contradictions that capitalism generates. Digital automation, the realm of activity that is outside human direct control, is the context in which politics, the lifeblood of the public sphere, is becoming objectified and yet more distanced and disconnected from the analogue and flesh-and-blood lives of people.

Nonetheless, a *postmodern* political participation is now widespread. Anyone, anywhere, with an internet connection can share political opinion, disseminate ideas, publish their own ideas, become whistleblowers, organize online to meet face-to-face and much more. Social media are everyday becoming more creative in respect of political participation. But this is automated (automatic) and remote participation enacted through the production and consumption of digital information and through looking at a screen. The cognitive act is based upon the processing of information, political and otherwise, that grows exponentially in volume and accelerates rapidly in its speed of circulation. The global media sphere is thus one where *participation is widespread, but its effects are weak*. The technologically induced transparency that Habermas hoped might bring clarity to Enlightenment values such as

freedom, equality and justice become clouded by information overload and 'social acceleration' (Scheuerman 2004: 1–26).

Global media society is one where participation is diluted by chronic distraction. Users are daily, hourly, bombarded by a network that is consciously engineered to promote a flitting from website to website to provide the all-important 'unique visits' data that websites need to remain commercially viable – and to keep the internet as a whole in business (Hassan 2012). Such evanescent participation in a sea of information generates what Malcolm Gladwell (2010) identified as political 'weak ties', where the connection is made easily (a click on an activist website, or a forwarded post on Facebook), but does not so easily translate into actual or ongoing commitment. The *temporal malaise* of democratic participation has been coming under scrutiny too, with theorists such as Jean Chesneaux (2000) and William Scheuerman arguing persuasively that social acceleration and what Scheuerman terms 'liberal democracy's time' (2004: 26–71) simply cannot synchronize in a positive way. As for Lunenfeld's hoped-for positive digital dialectic, this too seems doomed in a global media society that was made possible in the form that it is, precisely through the very thing that he conceded would kill his project: unfettered capitalism and the global triumph of techno-libertarianism.

And Jameson, whose aim was to revive Adorno for Marxism, is unable to have either its prognosis or intentions realized through a negative dialectic that created the global media sphere. The always-remote possibility of the realization of the Marxist prognosis of a communist utopia died finally with the 1970s emergence of late capitalism and postmodernity. Bhaskar's 'pulse of freedom' is human and is analogue, but has been made weak and arrhythmic by a globalizing and individualizing capital that transforms human relations to 'capital relations' where the abstractions of profit and instrumental efficacy become the primary ends in human affairs (Lazzarato 2014: 25). The Marxist intention of political freedom and democracy, similarly, has foundered in our late capitalist postmodernity, for reasons just set out, whereby analogue-derived theory and practice cannot survive in the hostile environment of digital networks owned by elites and organized almost wholly around exchange-value creation. This particular cause is not yet lost, but we need to fully recognize that the temporal rhythms of democracy were formed in an analogue age to reflect analogue conditions. This leaves us with a stark choice. We need to revise our

conceptions of 'democracy' for the digital age – or they need to be defended from their destruction by the logic of the digital.

We are left with only the Marxist *diagnosis* still intact. Marx's analysis in *Capital* Volume 1 orbits entirely around the concept of the commodity – being both the precondition and the product of capital (Marx 1976: 979). Capitalism is the last ideology standing – and that is why we are postmodern. Capitalism's contradictions continue to expand and these permeate fragilities throughout social and natural life. Adorno and Horkheimer were clear on this fundamentally Marxist point: while we have the rule of capital we have the rule of human and natural subjugation, and the 'false clarity' of the Enlightenment and the parallel rise of industry offer only another form of mythology (1986: xiv). But they go on to bring the Marxist diagnosis towards a far more accurate prognosis for our own time:

> Human beings have always had to choose between their subjugation to nature and its subjugation to the self. With the spread of the bourgeois commodity economy the dark horizon of myth is illuminated by the sun of calculating reason, beneath whose icy rays the seeds of the new barbarism are germinating.
>
> (1986: 25)

The seeds planted in the Fordist soil of the 1940s, when Adorno and Horkheimer wrote these words, have come to flower in our post-Fordist present. Global media society is the hothouse in which a new barbarism grows. We argue that much of the debate about the nature of media in the global context is at best superficial. It avoids what we see to be the vital question: what kinds of politics are possible in the context of digital mediation? Both Raymond Williams and Jürgen Habermas provide ways to think about this through their analysis of the analogue modality of print and speech and the political actions that stem from these. Both, however, acknowledge the corrosive influence of the commodity and of the function of mass media as a vehicle for advertising that gives decisive form and function to print culture. Nevertheless, prior to the age of digital media, the ideas and politics within this sphere, or spheres, and notwithstanding their being filtered through the sieve of the commercial imperative, were able to express differing worldviews. *Transformative* political struggles could be generated and mediated within this sphere. Liberalism, communism, fascism, labourism, social democracy – all the 'isms' of the twentieth century – shaped the lives of millions and changed the course of history in ways

that were not pre-ordained (Judt 2005: 13–585). It has been said that the 1960s, that decade of protest and struggle, of generational change and social rupture, was in fact the eclipse of the 200-year-long political experiment with the potential of modernity. As Christopher Hitchens suggested, 1968 was not the beginning of something, but the end of something, and Minerva's owl took flight in that tumultuous year. 1968 was the end too of Debray's 'graphosphere', where analogue print culture, and all that flowed from it, began its dissolution into the digital networks of the global era. But this was not a break with the old ways. It was the emergence of a postmodern 'soft barbarism' of low-grade cruelty, nasty small wars, widespread displacement of people, sporadic hunger and persistent poverty wrought by an extreme form of capitalism made possible by the rise and rise of digital logic (Hassan 2013).

The digital dialectic thrives, but not in a way that Lunenfeld wished for. Its oppressive logic mediates now on a global scale; and society – however we might define that even more nebulous concept in an individualized world – acts as computer technology's subordinate. Perhaps 'subordinate' is the wrong term; through networking and automation we are implicated yet excluded from computer technology's logics and goals. Adorno and Horkheimer saw this exclusion on the dark horizon when they wrote: 'extreme development of technology has made the masses in principle superfluous' (1986: 122). The 'in principle' has become reality.

In a pre-digital world, how could they have envisaged the extent of the extremity and the superfluity?

And how may we, mired in such postmodern *malais*e, become political participants again?

10 End of modern politics?

Two allegories

1

In a desert location outside of San Bernardino, California, Amazon has one of its latest facilities – a giant warehouse (or 'fulfilment centre') that has the ground space equivalent to 28 football fields. At the time of writing there are some 50 of these spread across the world in eight strategic countries. To say that Amazon has diversified beyond its original humble bookseller role would be an understatement. Amazon will nowadays sell almost anything; a look at their website for 'today's deals' shows that, among a bizarre concatenation of suggestions, its algorithms have decided to give prominence to a pocket screwdriver for US$2.99 and a 30 × 50 foot nylon US flag costing US$1,484.

Business innovation in Amazon fulfilment centres lies not in their size, their location or the range of available goods, but in the software that runs the storage and distribution system that brings the stuff to your door. In the post-Fordist planet of Amazon logistics, conveyor belt systems begin by taking their deliveries in the traditional way from trucks at the back of the centre. After that, sophisticated computers take over to work out where best to stow the myriad goods prior to sale. As Keith Gessen (2014: n.p.n.) records of his visit to the facility:

> The merchandise is placed on a shelf wherever it can be made to fit, not necessarily neatly, and in no particular order, so one cubbyhole on the shelf might be filled with a book, some paper plates, some jars of marmalade, and a chess set. Amazon's supply-chain engineers have calculated that it's more efficient for the items to be randomly dispersed, because as the next person in the supply chain—the 'picker'—walks around to fill someone's order, the scanner in her hand will tell her where the closest

> item is and then the fastest way to get to the next item after that. The job still requires a tremendous amount of walking—it has been estimated that some pickers end up covering as many as 11 miles a day, on punishing hard concrete—but it is a very efficient system.

Amazon's proprietary (and secret) software has taken one of the business's central tasks to a new level of productivity. But it's not quite perfect. Humans are still needed, but they constitute an excrescence that is alien to the logic of this clean and efficient digital system. Sore feet, boredom, general exhaustion, a counter-intuitive workflow and the panoptical feeling of always being tracked, monitored and surveilled by the same system that they must try to keep up with, reinforces the disconnectedness and essential unwantedness of a system that strives towards its own Nirvana: to work alone, to be liberated from the unpredictability and error and barriers to 'friction free capitalism' (Gates 1996) that analogue humans bring to digital systems.

2

On 6 May 2010 at 2.45 p.m. the Wall Street Stock Market crashed, suddenly and for only a few minutes. The origin of the plunge was in the high-frequency trading (HFT) operations, which at that time absorbed up to 73 per cent of the volume of all equity trading in the US (Iati *et al.* 2009). HFT is a relatively new innovation whereby trading by the big investment banks and brokers is conducted not by old-style floor-traders who scream down telephone lines and scribble furiously on a buy pad or a sell pad, but by super-fast and super-powerful computers using, like Amazon, proprietary and privileged-access algorithms. Computers are programmed to buy or sell short-term positions in vast volumes and in sub-millisecond transactions, which enables them to trim a fraction of a cent off the movement of millions of shares. It is of course automatic and served to liquidate many floor-trading jobs. The so-called 'flash-crash' of 2010 caused the Dow Jones Index to drop by 9 per cent, the biggest one-day fall in its history. The losses were regained a few minutes after the crash, but no one knows quite how it happened. One theory floated in a subsequent report noted that the usual fragmentation and fragility of the stock market, now operating almost without human participation, could easily be sent into a 'sudden spiral' if an unanticipated (for the algorithm) large trade interrupted the process (Lauricella *et al.* 2010). Just such a sudden and large-scale

sell order came from a mutual firm on that day. This triggered aggressive selling by HFTs, which in turn accelerated the sell orders of the mutual fund, creating the so-called 'hot potato' effect, which sends the spiral downward (Lauricella *et al.* 2010). The drop was arrested by an automatic stabilizer that intervened to cut off trading for *five seconds* which was time enough for the system to regain some kind of equilibrium (SEC Report 2010).

At this temporal scale things simply move too fast in the 'war between machines' (Finger 2013) for humans to make any impression at all. Disaster was averted only by an automatic emergency response. However, the dodged bullet experience did not send out any human signal about the value of reflection in the marketplace, and this failure says something important about the worth of analogue thought in a digital environment. As one human trader observed plaintively at the time: 'The electronic platform is too fast; it doesn't slow things down like humans would' (Cui & Lauricella 2010). Analogue qualities such as reflection, tacit knowledge and plain old experience are simply too slow and subjective when profit is derived from the interaction of numbers at high speed. Few concrete lessons were learnt and mini-crashes continue to occur at 'near monthly' rates (Levine 2014). Overall the stock market is moving away from HFT with the 73 per cent share of the trading market shrinking to 50 per cent by 2012. Nevertheless, this move was not prompted by any lack of faith in computers; it was purely a wait-and-see tactic until new and faster and more powerful software, in the shape of 'self-learning algorithms', are brought to the battlefield to do what humans can never do – function perpetually as instrumentalized automatons (Markets Media 2013). In this corner of free enterprise what we see is analogue 'speculation', the very essence of old-time capitalism, being eclipsed by digital 'calculation'. The shift is taking a digital capitalism, and the humanity that huffs and puffs behind it, towards realms unknown and hardly considered.

These short allegories are representative of a fairly obvious trend in the computerization-of-life process that we have discussed at length in this book. However, they also reveal a deeper effect of the process – that humans are increasingly the weak link in what computer theorist J. C. R. Licklider (1960) confidently predicted in the 1960s would be a symbiotic relationship. Since the time of Adam Smith, who marvelled in *The Wealth of Nations* at the stupendous rates of productivity achieved through the rationalization of bodies in the division of

labour, the further rationalization of humans towards extinction in the production process through automation has been the dream of not only Enlightenment moral philosophers, but also influential optimizers of industrial logic such as Charles Babbage. That people would be displaced by automation was largely taken for granted and even welcomed (by those who were not themselves workers) as 'labour saving' and therefore another sign of human progress. Those more critical perspectives that argued that automation would exclude, alienate and oppress humans were the domain of Marxists philosophers such as Georg Lukács (1990: 83–92), but these had only marginal influence outside the academy. The broader dystopian view was largely relegated to the genre of science fiction entertainment, which served only to sideline serious philosophical or political criticisms.

Sidelined also in this respect is contemplation of the view that full-scale and unrestricted automation has affected the domain of institutionalized politics. It is a connection that needs to be made, because the political process has become intractably caught up in what David Harvey termed the 'sea-change' of capitalism's trajectory since the 1970s (1989: 1, 121–89). What, then, does the logic expressed in these allegories suggest for the practice of politics whose heritages and habits extend back through a long (analogue) past that began with Plato?

Less popular than colonoscopies

Political apathy – a withdrawal from or indifference to elected representatives – is not a new phenomenon in the liberal democracies. Since the 1960s at least, political science and political theory have observed this fact and parsed its dimensions. A 1968 account from the US, for example, which may be argued to be broadly representative of (if sometimes more advanced than) the Western democracies, reported that:

> in general, two classes of apathetic individuals can be distinguished: those who fail to participate out of political indifference, exclusion, or incapacity; and those who consciously choose not to participate. […] the first is plainly the larger of the two classes.
>
> (Political Participation 1968)

The first group was said to include the 'uneducated' and those sorrier types 'mystified by political events'; and in a system dominated by men, women too had been seen to be historically socialized for apathy and to perform as passive political actors. The second group consists of

the educated who are politically aware, but cynical about the system, or are 'realist' about their chances of making any difference. And citing an earlier 1963 study, the authors of *Political Participation* conclude that the rest of this group 'believe that the system offers no genuine alternatives and that all efforts to change the outcomes are idle and self-deluding' (ibid.).

Notwithstanding the fact that *Political Participation* was written in that mythical year of 1968, it is conceivable that what its authors describe in terms of apathy could have settled into a permanent feature of modern democracy. The post-war boom was still more or less delivering for the majority in the West, and opting out, for whatever reason, could have been seen as a price worth paying if the system continued to deliver in respect of jobs, rising wages, social mobility – and, centrally, profitability for capital (Kolko 1988: 244). But as we have indicated above, 1968 was the beginning of the end of the post-war boom and much flowed from this. Three great currents of change, traumatic and wrenching, were in movement a decade later. These were in economics, with the ideological shift to the neoliberal worldview; in technology and the rise of information technologies; and, beginning around the early 1980s, the emergence of a new generation, the so-called Millennials, who would be the first to grow up and have their worldviews shaped by the revolutionary convergence of neoliberal globalization and network computing. The major consequence in terms of political apathy and participation in the liberal democratic system is that the second group in the 1960s dichotomy – the educated, the contemptuous and those who think that 'the system offers no genuine alternatives' – *are the same characteristics and attitudes held by the present-day majority*. This is significant and this is portentous, because this group, this generation, are those who will inherit leadership of our collective political near future.

Diminishing rates of voter turnout and the apathy that it signifies is a defining characteristic of the Millennials in terms of institutional politics. Salient also is that education and cynicism have bred an *antipathy* for politics and politicians that was either not present or was underplayed in many earlier analyses. In 2013, for example, a nationwide survey by Public Policy Polling (PPP) measured the US Congress's favourability rating against a range of humorous and not so humorous cultural phenomena. For example, when asked the question 'what do you have a higher opinion of: Congress or colonoscopies?' the response was 31 per cent for Congress and 58 per cent for the unpleasant alternative.

More seriously, overall fully 85 per cent of those polled had a negative opinion of their representatives (PPP 2013). In the US midterm elections in 2014 the turnout trend, which has been dropping continuously since 1970, touched a new nadir with less than 15 per cent bothering to cast a vote (Blake 2014). Less than 12 per cent of that voting public were Millennials, a cohort described in a Salon.com analysis article as a generation 'left behind and taken for granted' (Donovan 2014). 'Taken for granted', probably. But 'left behind' suggests that institutional politics has moved on. In fact, as we will show, it is the Millennials who have moved on and taken their political interests and activities elsewhere, across the US and across the world.

Academic surveys and article after article in mainstream media show that 'elsewhere' is online, to where Millennials do what comes naturally when they want to communicate with each other. Moreover, the estrangement and the disconnection have a dimension that goes beyond the political but serves at the same time to entrench the political divide between Millennials and previous generations still further. The writings of German sociologist Karl Mannheim are not much consulted any more. They do, however, give insight into the nature of generational change that has relevance today. In an essay first published in 1923 titled 'The Problem of Generations', Mannheim dealt with an aspect of generational change he termed 'the tendency inherent in location'. What he observed as a positive and cohesive process is that different generations at the very least shared the same physical location of country, region and nation, and that these intergenerational ties are crucial in terms of the maintenance of social solidarity across time (1952: 291–2). The theory has obvious implications for politics too. However, as Anthony Giddens observed in his theory of 'time–space distanciation' as a pre-eminent feature of globalization, the nature of the social relation of 'place' and 'space' has been transformed (Giddens 1990: 14). The idea of 'place' was organically (and analogically) linked to the physical and geographic attachments inherent in modernity; whereas 'space' is now being constituted as an invisible network-derived postmodern virtuality (Heim 1993: 157). The Millennials were born into postmodern globalization to inhabit a different world, a world that is borderless and is constructed through networked processes of virtual space and which displaces, increasingly, the materially produced relation to place that previous generations were born into and created their worldviews from. Moreover, this is the first generation that does not inherit its communication skills from the previous generation, but

make them up (heuristically) by themselves. We will shortly consider where those who are disconnected from institutional politics go when online, and further consider what kind of political futures these post-modern political practices may create. For its part, institutional politics continues largely blind to the shifts in computing that are transforming modern politics.

Another kind of self-delusion?

In political science and political theory today strains of political blindness persist in their elite disciplinary articulation. What this shows is that the generational political disconnection runs both ways, with an older and more institutional pre-digital generation behaving as if nothing much has changed in the political process, and a postmodern, digital generation believing that everything has changed. Both generations have elite theorists who have a good deal of influence, at least in the academy. Francis Fukuyama is a good representative of the first group. According to Fukuyama, *nothing* can deflect modernity and the old ways from its ineluctable trajectory. Writing in the *Wall Street Journal* on 6 June 2014, the unrepentant author of the 1989 essay 'End of History', which we touched on in the previous chapter, underscored his impenitence in rather grand prose to mark the twenty-fifth anniversary of the fall of the Berlin Wall and the shootings in Tiananmen Square:

> No one living in an established democracy should be complacent about its survival. But despite the short-term ebb and flow of world politics, the power of the democratic ideal remains immense. We see it in the mass protests that continue to erupt unexpectedly from Tunis to Kiev to Istanbul, where ordinary people demand governments that recognize their equal dignity as human beings. We also see it in the millions of poor people desperate to move each year from places like Guatemala City or Karachi to Los Angeles or London.

Fukuyama goes on to end the article: 'Even as we raise questions about how soon everyone will get there, we should have no doubt as to what kind of society lies at the end of History.' Fukuyama himself does not doubt that this society will be a form of liberal democracy. The essay reads as if it could have been written in 1974. Nowhere does he consider the impact of digital media in all this. He refers to Tahrir Square in Egypt, but not its important social media dimension; and he refers only obliquely to the Arab Spring of 2011 – and not at

all to the critical role played in it by information technologies. In an interview with *Forbes* magazine in 1996 Fukuyama does refer to the issue of information technologies and politics, but only in response to a direct question on the issue of 'trust'. He replied that:

> I resist the idea put forth by some of the information revolution enthusiasts that the technology itself will create communities. Obviously there's something to that in the way that it can empower people to communicate that's not dependent on geography. *But trust relationships and the existing social networks remain basic to the success of computer networks.*
>
> (p. 33, emphasis added)

This comes from a relatively long time ago, and it is now clear that information technologies *do* create communities of many and varied kinds, especially since the growth of Web 2.0. The idea of 'trust relationships' is one Fukuyama leaves in the air, but we will revisit it shortly. Nonetheless, Fukuyama is deaf to either the positive or negative transformative potential of computing. In his 2011 book *The Origins of Political Order*, he mentions the internet once, and disparagingly as a source of 'fantasies' for digital activists (p. 12). He writes of information technologies more broadly a handful of times, but only as peripheral to the processes of politics. The aim of his book is to alert us to what he sees as a 'democratic recession' emerging in the first decade of the twenty-first century, something that can only be rectified by the support of properly democratic movements. But as he suggests in his *Wall Street Journal* essay, people are moving towards this end anyway and it is our collective democratic duty to help them along.

Fukuyama's work is widely read and influential and we discuss him here because it is typical of the 'nothing has changed' perspective. In fact what we see in such work are aspects of the very 'complacency' he warns against, and the rigidity of thought that failure to engage with the digital revolution in politics brings. Political science, Fukuyama's discipline, will become an increasingly important tool for us to understand fundamental changes in the political process through economic, social and technological revolution. A major trope in our book is the transformed connection between time and the political process due to the digital revolution, and political science needs to keep up with developments. Nobel Laureate Douglass North agrees and berates the entire discipline when he writes that: 'Without a deep understanding of time, you will be lousy political scientists […] time is the dimension in which ideas and institutions and beliefs evolve' (2004: 1). And in *The Origins*,

Fukuyama himself writes with some clarity about what happens to the political process when the temporal dimension and the evolution of institutions are not factored into the analysis. We quote the passage at some length because what he says about *political decay* will become apposite to our argument at the end of this chapter:

> Political institutions develop, often slowly and painfully, over time, as human societies strive to organize themselves to master their environments. But political decay occurs when political systems fail to adjust to changing circumstances. There is something like a law of conservation of institutions. […] When the surrounding environment changes and new challenges arise, there is often a disjunction between existing institutions and present needs. Those institutions are supported by legions of entrenched stakeholders.
>
> (2011: 7)

Decay can also eat into an idea when it fails to adapt to its environment. As we shall see, Enlightenment-derived conceptions of democracy such as the one Fukuyama clings to are no exception.

Automated politics

With the emergence of groups such as MoveOn.org, Anonymous and the flux and flow of numberless political grouplets on social media such as Facebook, a major shift to online politics has become clear. But what does it mean? What happens to the political process when 'participation' requires little or no cognitive or physical effort or commitment? What happens when the transformed dimensions of space and time alter the fundamental processes of politics? And what happens when digital technology brings political communication close to the point of becoming automatic?

Manuel Castells is a good place to begin to look for answers. His book *Networks of Outrage and Hope* (2012) develops across a global canvas, where real people and real political movements are described in a kind of theory–journalism cross. In 2011 he visits the *indignadas* in Barcelona and finds his erstwhile research collaborators already busy in the streams of physical activism; he discusses the Occupy Movement and the Arab Spring in that same intense year of 2011 and senses keenly the potential of the ICT-politics nexus which is at the core a new way of 'contesting power', as he phrases it (2012: 1–20). In the flush of that year's excitement Castells builds upon the theorizing in his earlier book *Communication Power* (2009) and tries to answer the question he

set himself in it, namely 'where does power lie in the global network society?' (p. 42). He identifies a new form of power-potential which he calls 'mass self-communication', a 'potential autonomy' wherein struggles between corporate power and 'communicative subjects' is the terrain where politics will become decisive in the network society (p. 136). The disorders of 2011 were, for Castells, a digital dialectic being enacted in squares and streets from New York to Cairo, and at the end of his book he sees that the outcome hangs in the balance but that a new and positive political power through digital networks 'does not appear to be impossible' (p. 237).

More mainstream analysis of the same issues, and at the same time, came from journalist, digital editor for Channel Four Television, and ex-Trotskyist Paul Mason, with his 2012 book, *Why It's Kicking Off Everywhere*. For Mason, the 'Internet' is the answer to the book's question. Communication networks have given space to the pent-up frustrations and disillusionments of a generation of educated youth across North Africa, in austerity-wracked countries such as Greece and elsewhere. Mason sees these (and using the same noun as in the title of Castells' 2012 book) as a 'great river of human *hope*' where the ideals of the 1960s, the passions that fuelled students and workers all over the world at that time, 'are back' (p. 4). In particular, it was the *speed* and *efficiency* of ICTs that proved decisive for what he termed 'the handbrake turn for humanity' onto a new road. As Mason puts it, 'the web browser, the cell phone, the GPS device, the iPod […] above all the smartphone […] has accelerated what the contraception pill and divorce laws started: it has expanded the power and space of the individual' (p. 134).

Castells and Mason, the academic–activist and the journalist–activist, both observed the same potential in the same generation. The first global upsurge in 2011, which saw dynasties topple, governments buckle and people move from their screens to the streets, filled them both with 'hope' – the very same emotion that got US president Barack Obama elected through the digital activism and digital payments of millions of volunteers for the Democratic Party in 2008 and 2012 (Scherer 2012). For these and the millions inspired by the real-world examples, this was a new kind of politics, a techno-politics that is not only 'new' but also 'improved' and 'accelerated' in that after the long years of subjugation to global neoliberalism, the ICTs that made neoliberalism possible seemed to be emerging as its gravedigger through their ubiquity in the hands of what Castells called 'the creative audience' (2012: 132).

A question to ask at this point is: if automaticity is at the core of the logic of computing, does that logic insert itself into the interaction between computers and the processes of politics? We will give a fuller answer to this question in the next section. But as a preliminary thought we can say that the migrating 'trust relationship' that Fukuyama stipulated as necessary to make computer networks a success in the social sense have become distorted by those very networks. The trust of millions, it seems, has been placed in digital networks to do their thing in their 'efficient' and automatic way. In this they perform the 'magic' of things automatic that we are susceptible to, and relieve us of the effort of thinking too much about what we are really doing. This is reinforced by the speed of events, a speed set by communication technologies alone. In terms of the rapidity of events in the Arab Spring in particular, the technologies themselves seemed to set the pace. Speed was a power of the dissident networks and the fact that hardly anyone saw the uprisings coming was because, as Mason accurately phrased it: 'it happened fast' (2012: 135). And this is seen as positive.

Not all is positive theory and hopeful interpretation of experience, however. Just prior to the events of 2011, media theorist and Belarusian *émigré* Evgeny Morozov analysed other examples of networks and people and political power, and reached different conclusions. His 2011 book *The Net Delusion* considered the effects of digital politics in the context of a struggle between individuals and groups seeking to promote political projects on one hand, and a more repressive state apparatus that seeks to contain or curtail them on the other. A welcome corrective to much of the hype concerning the wonders of online politics, Morozov uses case studies from his homeland of Belarus, repressive theocracies such as Iran and the communist dictatorship in China to show that, in fact, real power still lies with the state. When it is the state versus the people, with no corporate interests involved, 'the people' are not favourites to win out. The state has access to servers, to codes, to the means to shut down websites, open up bogus websites that purport to be anti-state, and the state has the capacity to trawl the big data pools that social media generate among dissidents. Indeed, security agencies such as the KGB in Belarus actually welcome people going online to voice their opinions. Once dissidents could operate clandestinely through *samizdat* circulation; now they become automatically visible and able to be targeted, found, jailed or murdered (2011: 155–6). Morozov's principal aim in the book is to 'ditch cyber-utopianism and Internet-centrism' (2011: xvii). He does this admirably

and makes a compelling argument that should warn us against a naive belief that existing social networks and analogue political processes can simply be replicated in the digital realm. Humans, constituted as either dissidents or as part of repressive state apparatus, are the weak links when trying to make social reality through machines of automaticity. Communication, the basis of politics, is rendered too fast for democracy. It is also too fast for a state to do any more than hold to a permanent reactive present, where reform of itself or of political society is impossible. Morozov expresses something similar at the end of his book:

> My point is that digital activism should not be valued solely on the efficacy with which it achieves the goals it sets for itself. Rather, since it clearly has an ecological effect on the broader political culture that produces it, we need to assess its usefulness based on the overall goals and directions of that culture.
>
> (2011: 327)

We have seen that the 'broader political culture' is a postmodern one, a globalized one and a neoliberal one whose 'goals' beyond profitability for capital and the maintenance of power in elite hands are not at all clear. What does a goalless and directionless political culture look like? And what, ultimately, can digital activism do to give it democratic direction?

The soft barbarism of automated politics

Castells and Mason are former Marxists and their perspectives retain much of this political–philosophical heritage. Both continue to see an unfolding of history where the oppressed masses will someday inherit the Earth. Politics continues in its Enlightenment trajectory where reason directs progress and, like history, it has a fixed arc that political struggle will clarify and guide. Imbibing from Marx, both also imagine that technology means progress, the main issue being how the contradictions that technology generates under capitalism can best be exploited. Mason is clear: information technology 'shapes our consciousness and magnifies the crucial driver of all revolutions – the difference between what could be and what is' (2012: 85). Castells is more abstract: information technology creates a 'space of flows', a digital dynamic of dissident that can rapidly translate to the 'occupation of social space' (2012: 59). This was decisive in the dramatic Arab Spring

revolutions that brought down, for example, Egyptian dictator Hosni Mubarak through the occupation of Tahrir Square in 2011. And both emphasize 'hope' – that quintessential weasel word in politics, derived from the quasi-religious sentiments that underpin much Marxism and which can be made to mean anything.

The breathless pace of political action in 2011, and the hopes that many held out for fundamental political change through online means, look rather different only a few years later. For reasons we have no room to fully explore here (see Hassan 2014) the accelerated and automatic political communication of these events, especially the Arab Spring, created a political vacuum. The dissidents of Egypt, Tunisia, Libya and elsewhere set in train processes of power contestation that they were not equipped to exploit. In the end, it was analogue politics of the old and established and brutal and organized kind (the Muslim Brotherhood, the army, the old institutions of power) that re-established itself and adapted to the new challenges of holding on to power. These conflicts are still being played out, but of one thing there is no question – a democratic future does not lie in the capacity of millions to come together through computer networks in order to bring down a repressive regime, or even to democratize and make more accountable a formally democratic one. To be able to work out *what to do next* to consolidate the gains made by hugely disparate groups with vastly different agendas seems to be an insuperable task without a long pre-history of common struggle and the striking of political roots (Hassan 2014: 187–206). Even dissent that has a focus, such as the online-organized global protest against the immanent invasion of Iraq in February 2003, was greeted with contempt by Western leaders such as Tony Blair and George W. Bush, who knew that it constituted no political threat to their military plans.

Post-2011 the hopes for a new kind of politics appear to have been dashed on every front. The Middle East is largely in chaos, with dissidents in prison or in hiding or dead (Cockburn 2014); the Chinese government's cyber war against its own people is an asymmetrical one, with the Communist Party and its many thousands of dedicated experts able to 'tame' social media, choose its battles and then pick off those it deems a potential threat; and Western activists such as MoveOn.org, Indymedia, Occupy and others, are contained and marginalized and in danger of being worn down by governments who, seeing such opposition as a political priority in line with the 'war against terror', are learning how to deal with them. This is not to say, of course, that

governments from the USA to Egypt and from Australia to China *know* how this will all play out. They don't. As the economic crisis of 2007 showed, government bureaucracies and policymakers are flying blind – or, more precisely, functioning on autopilot.

Antonio Gramsci, the Italian Marxist philosopher, gives a famous line in his *Prison Notebooks* written in 1923 that allows us to consider the state of such politics today: 'The crisis consists precisely in the fact that the old is dying and the new cannot be born; in this interregnum a great variety of morbid symptoms appear' (1971: 276).

The soft barbarism (Gramsci's 'morbid symptoms') of our present global political order emanates from the fact that institutional politics (the politics of markets and globalization and individualism etc.) is unchallenged. To be unrestrained is a disincentive to change, but neoliberal democracies are *unable to change*. There are two dimensions to this institutional stasis. One relates back to Fukuyama's thesis of decay, which echoes Gramsci's quote very clearly. The absence of plausible countervailing forces to hypermarket capitalism means that, along with the disincentive for change, the 'present needs' of society that Fukuyama speaks of, especially those that relate to the social fall-out from globalization, are left to fester and worsen. The other dimension is technological–temporal where there is, to use Fukuyama's quote once more, a radical 'disjuncture' between the rhythms of political processes and those of the dominant and domineering (in terms of priorities for politicians) global economy that functions increasingly in a real-time present, or on a very short-term horizon. Across the Western liberal democracies, power at the executive level of government functions to liaise with corporate level capitalism to deal with day-to-day crises, both domestic and global. For those politicians still concerned with their democratic responsibilities to those whom they represent, the time needed to identify, debate and institute long-term and positive reform is simply not available. Instead unexpected and unanticipated events, economic, political and military, are given priority and take up most of the energy of the elites and the time needed to respond to them (Scheuerman 2004: 187–224).

Since the 1970s, capitalism has shed many of the social democratic checks and balances that had given it an almost human face. As a result, the core logic of a system that Marx saw as 'dripping from head to toe […] with blood and dirt' (1976: 926) is given a freer rein than it has enjoyed for a century – the soft barbarism of our postmodernity we are becoming hardened to. We see it in the growing disparity between

rich and poor, a gap that has not been as wide in the USA, for example, since the 1920s. The 'working poor', an anodyne term to describe the crushed existence of hundreds of millions of people across the world, actually distorts what is a hyper-exploitation by capitalism. A feature of an earlier capitalism was the individual irresponsibility of its elites. This feature is back. Any sense of responsibility for the inability to properly confront global warming, or of politicians standing up and saying 'this was my fault' and resigning on principle for *any* reason, or of bankers admitting that their actions have been immoral and their salaries an ill-disguised form of theft and so on, are all notable in their absence. Moreover, our *collective* lack of a sense of moral responsibility for the widespread return of food banks, of the demonization of the 'undeserving poor', of the growing homeless and catastrophic refugee problem and so on, would appear to have no limits, no line not crossed nor atrocity countenanced for the sake of expediency or the quiet life. Such lack of responsibility can be connected to a growing environment of automaticity in production processes, in communication, as well as in politics. The trust that we casually place in machines lulls us into the sense that, somewhere, someone or something will take care of it for us. Though we may not accept this comforting idea if we reflected upon it, just as with global warming we don't reflect too much, because it's easier to live day to day that way.

Gramsci's period of crisis was for him 'an interregnum'. His Marxist faith in the revolution was understandable in 1920s Europe, where class conflict and class-based politics were the norm in the context of post-First World War economic and social convulsion and with the Russian revolution still in its primary phase of 'hope'. History seemed to be on the move. The word 'interregnum' means a period or gap between reigns or governance. The term also suggests a form of continuity, if not a form of progress, where, through dialectical materialist struggle, a synthesis emerges through the resolution of contradictions in capitalist society, the movement of society towards another, higher, phase. Contradictions abound today, but there is no class-based politics that would channel political energies towards class-based solutions – or even class compromise. In our postmodern neoliberal economic age – to which, as Margaret Thatcher reminded us, 'there is no alternative' – there *are no real alternatives* available to us.

In his career-long critique of progress, John Gray has argued that we must separate out science and technology from human affairs. In the realms of science and technology, progress expressed as knowledge

is cumulative and concrete and we see its evidence in medicine, in physics, chemistry and so on. Problems can be identified and solved. The other realm is that of human affairs, which is constituted by ethics and politics, and which has never had a collective idea to advance. It is perennially beset by conflict that may only be suppressed. Politics therefore oscillates always between civilization and barbarism. Solutions to social problems cannot be guaranteed nor can they be made to last. Progress in science and technology therefore does not mean progress in human affairs. As Gray put it: 'Science increases human power – and magnifies the flaws in human nature' (2002: xiii). The science of digital computing has done precisely this to our analogue human nature. It has instrumentalized our flawed productive forces and our flawed economic processes far beyond anything philosophers of modernity could have imagined possible. And it has magnified the flaws in politics, the modality through which our conflicts are either suppressed or aggravated. To imagine that postmodern politics of networks can somehow take us to another realm of even temporary civilization is therefore illusory. We are in a long ebb tide of soft barbarism that is different from that of all other periods in human history. So dependent have we become on information technology and automaticity to construct our imagined Nirvanas, we find our species in postmodern political stasis. Forced to function increasingly within a constant present, institutional politics no longer has time to reform itself towards a more positive state of human affairs. Online forms of politics cannot escape the orbit within which institutional politics must exist. But online political activism is even worse off. By embracing the digital, it disconnects itself still further from the temporal and ethical realms of analogue reality and can therefore have little or no effect upon whether barbarism recedes or advances.

11 Technological innovation and time

Technically sweet

Innovate. *Innovationen* in German, *innovare* in Italian, *innover* in French. These almost identical-sounding European words have a certain beauty about them. If you don't see the beauty in print or pronunciation, then perhaps you will concede that they would at least suggest something *positive*. Technological innovation in particular tends not to be taken as negative in any overtly harmful way unless, perhaps, we think nuclear fission and fusion, which made possible the atomic bomb, an innovation with only one purpose. Robert Oppenheimer, the lead scientist in the development of the atomic bomb, did not feel very positive when, after witnessing the test explosion, he said, quoting a line from the Bhagavad Gita: 'Now I am become Death, the destroyer of worlds.' Dramatic, yes, but so is the footage of the fireball and mushroom cloud curling up over the New Mexico desert in 1945 – as dramatic as the bomb's subsequent deployment in Hiroshima and Nagasaki were horrific. Oppenheimer used his testimony before a security clearance hearing for the Atomic Energy Commission in 1954 to give another insight into his attitudes to technology and innovation. It was a perspective less melodramatic, but nonetheless just as important as an example of an age-old view that the scientist takes to his or her work. Here is his reply to a question regarding any reservations he may have had about working on a crash programme to develop the hydrogen bomb in 1949, just as the Cold War with the Soviet Union (which had tested its own bomb in that year) was getting very tense: 'When you see something that is technically sweet, you go ahead and do it and you argue about what to do about it only after you have had your technical success' (Polenberg 2002: 46–7).

Along with the cool scientific detachment (which is ethically questionable), there is the assumption regarding innovation, even innovations that are potentially catastrophic, that humans with their reason will

solve any problem, because these are technical processes that humans invented and so humans will have ultimate control over them. It is this assumption that we wish to consider in this chapter. At the end of the previous chapter we looked at an idea from the philosopher John Gray that we can develop further here. He argued that science and technology are set upon one path, and 'human affairs' – society, politics, relationships, community and so on – travel upon another. But these interact: 'science increases human power' but it also 'magnifies the flaws in human nature' (2002: xxiii). Gray notes also that the assumption that we are masters of our scientific creations derives from religion, principally Christian eschatology, which looks to the future, to the end of the world and to the heavenly afterlife. Secular society has adopted this as a belief in the trajectory of human progress, Gray believes:

> In science, the growth of knowledge is cumulative. But human life as a whole is not a cumulative activity; what is gained in one generation may be lost in the next. In science, knowledge is an unmixed good; in ethics and politics it is bad as well as good.
>
> (2002: xxiii)

The growth of science-based knowledge as an 'unmixed good' is perhaps taking it too far. Our example of nuclear fusion has to be a mixture of bad and good: technology that can bomb humanity back to the Bronze Age is bad in itself – as well as in the fact that technology used in such a way would also obliterate much of the good that science and technology had accumulated. Nonetheless, the idea of the accumulation of such knowledge is generally a sound one. It grows and intensifies and feeds on itself to become stronger and more complex and able to permeate all registers of human life. Innovation is the leading-edge expression of knowledge cumulatively powering knowledge in science. However, such accumulation can also overpower us, individually as well as collectively. And individually as well as collectively we have little power over the rate, form and direction of innovation. We are born helpless into a growing tide of invention that feeds into growing technological sophistication in our lives, as well as into a thickening complexity of technological interaction, especially digital interaction. This does not necessarily mean we are destined to be slaves to innovation, no matter how much it may feel like it in our consumer-internet existence. What it does mean is that we must recognize that, with the arrival of the dominating force of

digital logic and digital-derived forms of innovation, the *longue durée* of the arc of technological development – and the deep-set motive forces of that development – have evolved into more extreme forms and are set upon a systemically directed path that we are not easily able to move from.

This book has already traced that arc of development in its outline. From Classical and Hellenistic Greece and the discovery of the power of mathematics, to their rediscovery in Renaissance Europe where, for example, Galileo considered number as the language of the universe; to the Enlightenment–capitalism nexus that brought science and industry together as an instrumental–rational process; to our current postmodernity where technology, principally in its digital form and propelled by market competition, has taken the abstract concept of 'efficiency' from being a secondary consideration in ancient times to an important consideration in modern times – to an all-consuming logic in our own time. Necessarily, the sharpening focus upon technical efficiency, leading to digitality and speed in the service of profit, has meant a narrowness of vision regarding what innovation in science and technology make possible. This is not only a threat to our subjective self, where what we can be is continually constricted by the essential paucity of what digital logic can enable, but more practically, a threat to democracy also. In 1987 Paul Feyerabend reiterated this point by reminding us what the anarchist Mikhail Bakunin wrote in 1872, warning of the 'reign of scientific intelligence [as] the most autocratic, despotic, arrogant and elitist of all regimes' (1987: 22–3). Closer to the present, John Johnson's *The Allure of Machinic Life,* in part a synthesis of the work of Paul Edwards with that of Gilles Deleuze and Felix Guattari, discusses how computing in the capacity of cybernetics is creating a 'closed world' where subjects are reduced increasingly to a singular dimension, and where cognitive functions 'are abstracted and deterritorialized (decoded) and then reinscribed (recoded) in a transformed context' (2010: 289).

Gray believes we will never master technology. This is certainly true. The knowledge that forms the basis of technological innovation accrues day by day, but it is also diffusing; knowledge is free in the sense that it can never be put back into a bottle. However, it's not a question of mastering technology. We must relearn how to work *with* technology. We need to appreciate how the circle of action that Gehlen describes, and which was our first encounter with tools and with innovation, could have conceivably taken the ancients of our species

in *any direction* in respect of human development. In other words, we could have taken technological paths that are almost unimaginable to us today. But our whole history and our individual socialization make such a thought difficult to comprehend. Indeed to recognize that with our primary relationship to basic tools we could have created vastly different worlds, worlds that may or may not have had machines and computers in them, is an almost impossible thought-experiment, so deeply entrenched is the present reality in our mathematico-machinic-digital lineage. Such a reckoning would require another and rather different book. What we want to do here is to show in very broad terms where innovation as we know it comes from, what it is doing to our world today, why and with what consequence we adhere blindly to its path and whether it is possible to set upon another path. Crucially, and this question may hold the key to considering what may be done: what are the links between technological innovation and temporality?

Why do we innovate?

Citing the Merriam Webster Dictionary as its source, Wikipedia defines 'innovation' as 'a new idea, device or process'. The Wikipedian who keyed this particular entry does quite a good job and there are useful items in it. However, 'innovation' in both description and example is wholly confined to modernity and to the even narrower context of business. The answer to the question 'why do we innovate' according to this quick and troublingly magnetic online source is easy: we innovate naturally and positively in the natural and positive context of commercial competition. In such a setting, innovation flourishes in collaboration as well as individually. For example, we see innovation in those parts of society engaged in research and development (R&D) in numberless businesses in private or public corporations. And everywhere there are entrepreneurs who invest money in order to bring innovative products and services to the marketplace. Entrepreneurs are motivated by profit, but such people may also benefit from the esteem in which they are generally held. For instance the contemporary pioneers of Silicon Valley, such as Steve Jobs, Bill Gates or Mark Zuckerberg, have made lots of money, but their innovative work is commonly seen as something more – as something *heroic* and role-modelling in ways that rich bankers or lawyers would never be credited for. And across the world there are innumerable anonymous people from all walks of life who experiment and adapt and tinker

with all kinds of things, simply because they are fascinated by how things work, and the challenge to solve problems motivates whether there is profit in it or not. This perspective on technological innovation is deeply rooted in our culture, but it does not say anything about *why* we (or at least some of us) are like this.

The Wikipedia entry ignores a long pre-capitalist history of human invention and innovation. Through the work of Arnold Gehlen we showed how it was that in our 'unfinished' state in the early phase of the emergence of our species we adapted to tool use. This was his 'circle of action' that not only enabled us to survive and thrive as a species, but the technology relationship also distinguished us from other species. The central difference, as we noted, was not only that we use tools – certain primates and other animals do this as well – but that we also invent *new* tools and *improve* upon existing ones. This was the basis for a unique relationship with our environment as well. And as Gehlen and others (McLuhan 1964; Ong 1982) have noted, technology use, especially writing, constituted the basis of human consciousness, that is, the capacity to be self-reflective and to be able to see ourselves as apart from nature. Human technology use thus developed in a highly artificial and paradoxical way. It set us *apart* from nature, but nature was what we ultimately *depended* upon for the raw materials of our survival. Nature itself does not innovate; it adapts and evolves. However, 'adapting' in the way that we did enabled us to reflect and invent and then work upon a nature that has no purpose – but we do this with our own purpose in mind and oriented towards defined ends. The circle of action that Gehlen theorized was always tenuous for the early emergence of *Homo sapiens*. It kept humanity clinging to the rock of bare existence for most of our history. However, our sporadic capacity for innovation meant that very gradually, and with no *dominant* purpose and direction until the age of modernity, it enabled the original dialectic of tool use to be transformed and oriented towards its negative pole, towards a specific innovational logic of machinic efficiency that began to arrogate to itself a power that was implemented through an unviable attitude of domination towards a natural world before which all humans are fundamentally vulnerable.

That this pre-modern history of technological innovation is largely invisible for most of us is a problem. Wikipedian visions of innovation-as-progress and as the normal state of life on Earth for our species occludes a great deal. It leaves us ignorant of the fact that we are vulnerable and fallible in our relationship with technology and nature.

It leaves us ignorant of the fact that it is only through technology and nature that we can survive, and technology masks our vulnerability and fallibility under a skein of culture and civilization. Modern humans reasoned that through science we were disclosing the laws of nature. However, such an attitude towards a science of universals merely concealed the tenuousness of life for a particular form of life – humanity. To blithely accept progress and innovation as natural means technology, when unconstrained and instrumentalized, continues to magnify our flaws and exacerbate our weaknesses and our distance from nature. Our inability to deal with the realities of climate change, for example, shows how distant we have become (Klein 2014). And part of the problem of coming to grips with climate change is its temporal dimensions: its processes are too slow for us to recognize in a meaningful way and its effects are articulated into a future too far off to be easily perceived by us as a clear and imminent threat. If technological innovation distances us from nature, then the technologized time of the clock and network (see Chapter 8) reinforces this negative process. Let us move now to consider the largely unexplored connections between technological innovation and technological time.

Innovation as the analogue engine of the open future

Innovation, as we have suggested, connotes positivity. The term itself is defined as describing something new. It is related to the Latin *novum* and to the term 'novel' which both mean a *new* or *fresh* or *latest* or *original* thing. Moreover, these terms contain a strong temporal sensibility. For example, in one sense the new can connote the present, something that did not exist in the past but is here today. Think of newspapers – every day a new one appears in the present. But the news relates what has already happened, things already in the past, and the present in which the news is read slips inexorably into that past to become history. In another sense, innovation in technological processes arrives in our present, but they come to us facing the future; indeed one can almost accept the idea that they come to us *from* the future, both as harbingers of what will be in our lives and as forms of things *unexpected* in their newness and novelty. There is another, related sense, perhaps a stronger sense for us collectively, where innovation in technological processes *colonizes the future*, creating and shaping a future that has been opened up for us in positive ways. This is the innovation of analogue modernity. And this is the positive temporal

appreciation that still has residues of purchase where, as Barbara Adam and Chris Groves put it in their *Future Matters*, 'If the future is seen as ours for the making and taking then imagination may be employed for conjecture, creation, colonization and control' (2007: 18).

The 'four c's' alliteration that Adam and Groves express could be perhaps communicated just as effectively with a single 'c', that of capitalism. And it was through capitalism that modern innovation found its most powerful expression with respect to the future. Modernity explicitly projected futures that were open and full of hope, a hope that was also a growing *expectation* of progress over the generations. Since at least the middle of the eighteenth century, capitalist logic tied to Enlightenment thought, and given material reality through manufacturing processes, seemed to be a combination that could conquer any problem. An example of the future-building prospects that were contained in the confluence of commerce, philosophy and commodity production was the eighteenth-century mill owner and utopian socialist Robert Owen. Unlike most other capitalists, Owen – a member of the renowned Manchester Literary and Philosophical Society – took the ideas of progress to mean more than the instrumental progress of business. Owen saw this kind of capitalism as 'destructive of the health, morals and social comforts of the mass of the people engaged in it' (cited in Cole 1971: 205). He is most famously remembered for his cotton mill in New Lanark, Scotland. This manufactory was also a radical experiment in social engineering, where workers were treated as human beings and given decent wages and hours, clean accommodation, nourishing food, instruction in music and dancing and the encouraging of open-air activities. It is tempting to see Owen as a kind of proto-Henry Ford, an industrialist who had his own ideas on social engineering (Grandin 2010). But Owen didn't see people as cogs to be shaped and moulded as Ford did, but as equals, who along with enlightened people would, in Owen's words, 'create a rational, intelligent, wealthy and superior population' (cited in Beer 2002: 171). Owen had his detractors, especially among those with whom his manufactures competed; but he also had many followers who thought he was helping to create a future Jerusalem. Among them was a contemporary chronicler who saw Owen and his project in decidedly temporal terms and wrote that, with Owen's ideas and good works, he was happier 'to revel in a delicious dream of the future than to be oppressed by the nightmare of the present' (Vassar College Archives).

Owen's dream of a socialist utopia did not materialize. Nonetheless, from the phase of early industrial capitalism and the Age of Enlightenment through to the late twentieth century, the general attitude towards the idea of social progress was maintained and indeed grew to become one of the metanarratives of modernity. But how can we theorize this as a temporal process?

In a highly original essay titled 'Precariousness, the Secured Present and the Sustainability of the Future', David Carvounas and Craig Ireland show how, through a synthesis of the writings of time theorists Norbert Elias and Reinhardt Koselleck, the concept of the future was one that *began* with modernity and was very much formed around modernity's political economy. Prior to the modern period the idea of the future, such as it was, derived from Christian eschatology. A future that involved people living in this world came only vaguely to light with Thomas Hobbes, who imagined a political future of peace and predictability *only if* the present had been secured politically and economically. Hobbes' own seventeenth-century present was a time of tumult and disorder, a reality that had always been more or less the way of the world and how life was endured, as peasant or philosopher or king. His genius was to imagine how it could be otherwise. As Carvounas and Ireland tell it, if people have a secure present, they reduce the need 'for instantaneous reactions to constant unpredictability [and so] an extended sense of foresight can gain a foothold and shape [the] temporal horizon' (2008: 158). The break with pre-modern temporality to imagine an earthly and reasoned future was a relatively slow one, though. For example, the authors cite the case of Jean-Baptist Colbert, Louis XIV's Minister for Finance from 1665 until 1683. Anticipating the need for strong oak masts for the French fleets 200 years in the future, Colbert had thousands of trees planted in 1670 – trees that still grow today uncut in the forests of Tronçais. Contrast this with a case a century-and-a-half later, in 1830, when Alexis de Tocqueville questioned an American sailor as to why US ships seemed to be built to last only for a short period. The sailor replied: 'the art of navigation is everyday making such rapid progress, that the finest vessel would almost become useless if it lasted beyond a certain number of years' (Carvounas & Ireland 2008: 163). The transformation in attitude towards the future is clear. In Colbert's era of early modernity, the future was perceived as something real and as a secular time to be planned for, but it was also a time that would be filled by a *continuation of the present* – a time when the same kinds of ships would be fitted with the same kinds of masts

for the same purposes. In de Tocqueville's era, the future was a time even more keenly imagined, but it was a time that was assumed to be *divergent from the present*. The latter perspective is more fully modern in that the idea of change, even from the basis of a relatively secured present, was something unavoidable, something influenced above all by technology and something that would emerge from the growing dynamism of the capital–technology nexus that took innovation and an open future as fundamental precepts.

De Tocqueville considered the United States to be very much a vision of the future. Its growing dynamism and technological prowess seemed to him to assure its destiny as one of the great nations of the world. Capitalism in America, for all its rapid development, booms and busts, incessant transformation and technological revolution was, paradoxically, an example of how capitalism globally, especially after the failure of the revolutions in Europe from 1789 to 1848, would help secure the present politically as well as economically. Over the decades, innovations within capitalism itself – *ad hoc* countervailing measures such as banking and tax changes, labour reforms, corporation laws, anti-trust regulations, new credit systems and so on – provided the stabilizers needed to make the system less volatile and anarchic and less exposed to what Carvounas and Ireland identified as 'constant unpredictability' (2008: 158). A projected future was therefore increasingly an open one, open in a positive way where technology would lead in the shaping of a future that would be knowable, if not in its detail, then certainly in its divergence from the present in ways that would inspire people and give them faith in the idea that their sons and daughters would inherit a better future.

From the late nineteenth century through to almost the end of the twentieth, analogue machines with their recognizable, though still world-transforming, effects in the form of cars, ships, aeroplanes and all manner of consumer goods were indeed the engines of modernity and its open future. However, and by way of a slight irony considering Tawney's twinning of him with Robert Owen, it was the production methods of Henry Ford, that rather more successful social engineer of the twentieth century, which were to be the final analogue engines for the production of the open future. David Harvey observed in his *The Condition of Postmodernity* that, by the 1960s, Fordism had become so prevalent, so powerful and all-encompassing that it constituted a 'total way of life' (1989: 135). This was a way of life that was to change, however. The 'secured present' that many of the Baby Boomer generation

had taken for granted became unanchored. Fordism, with its capacities for planning and predictability and to produce a foreseeable future from its relatively stable political and economic present (or so many thought), unexpectedly 'came to maturity' as Harvey phrased it, and over the decade of the 1970s, Fordism indeed 'ran out of options' (1989: 185). Fordism also ran out of (analogue) time. And the consequences of this will comprise our discussion for the rest of the chapter.

Innovation, alienation and the digital future

In their book *The New Digital Age*, Google Executive Chairman Eric Schmidt and co-author Jared Cohen set out visions of what connectivity will mean for the future. In an otherwise anodyne clutter of unremarkable prognoses that are good, bad, but mainly good, one passage leaps to the eye in that it encapsulates the whole enterprise in a single sentence. In flat prose they write that: 'contemporary [digital] services […] give us a sense of what the future will look like: an endless amount of content, available anytime, on almost any device, and at little or no cost to users' (2014: 24). And that's about the sum of it: the future, should we not know it, will be digital and filled with endless content that is ever more widespread, increasingly connected and inexorably cheaper. Absent, completely, is any sense that the future might in some way diverge from our present, or constitute a form of progress in any meaningful way beyond the more efficient. Schmidt and Cohen are the Colberts of the twenty-first century. They project a perpetuated present onto an intensified future, a future containing, primarily, information processes and their political, economic and cultural derivatives. The trees that they plant today are ideological ones, the assumption being not simply that the far future will be the same as the present in terms of its technological course, but that it cannot possibly be any other way. Enlightenment and modernity have parted company with digital capitalism in this vision.

The mantra 'the future is digital' is a common enough trope. From Nicholas Negroponte in the early 1990s, to Schmidt and Cohen today, futurology of this sort would appear to be easy. It's easy because there are no divergent futures to think hard about, or to use one's imagination on; just follow through the logic of connectivity, efficiency and automaticity, and sundry positive scenarios will suggest themselves: our lives will be richer through more (informational) choice; we will be better informed about all kinds of things; social media will connect us in all kinds of ways around all kinds of spheres of interest; and our lives

will be made more efficient and leisure-filled and so forth. But what if we consider the digital future from the perspective of the political economy of temporality? If we do, then the digital future begins to look quite different from what are the essentially *analogue assumptions* of technological innovation that, from Negroponte on, have been routinely and unreflectively grafted onto what is a very dissimilar digital logic. And if we do, then the digital future begins to look not like a future at all, but like living in a constant present where 'innovation' in technology has been narrowed down to a one-dimensional digital arc, and where humans begin to be afflicted by a new form of alienation, a postmodern digital alienation that is additional to the analogue-based form that capitalism bequeathed to humanity at the dawn of modernity.

We begin by considering how secure and how stable our present is, because as we have argued through Carvounas and Ireland, the stabilized present 'allowed for a sense of foresight to cast a gaze that goes beyond the short-term exigencies of immediate need' (2008: 160). Writing in 2016 the question is somewhat superfluous. Instability and insecurity, especially in the all-consuming economic sphere, has been with us since the 1980s. The neologism 'precarity' has emerged to describe this state. Indeed some theorists such as Brett Neilson and Ned Rossiter argue that precarity is more than an economic category. They see it as the *normal* socio-economic and political state of capitalism and suggest that the relative stability of Fordism (circa 1945–73) constituted the exception (2008: 51–72). Exceptional or not, the idea of precarity does place the present post-Fordist age into a useful context. A generalized instability and uncertainty are terms that need no theorizing or historicizing or translating for much of humanity today as it struggles with no wages, low wages, poor working conditions, diminution of human and political rights and so on. But what does this mean beyond the difficult and often despairing practical life that precarity delivers on a routine basis?

The lack of security and stability means, in a very real way, a regression not simply to the boom and bust cycles that have been a feature of capitalism for most of its existence since the eighteenth century, but also to the *pre-modern* normality that was the experience of Hobbes' age: 'nasty, brutish and short'. Some of us may live longer lives than those lived in the seventeenth and eighteenth century, but nasty and brutish may still be added to the barbarism side of the ledger of life in our postmodernity. Precarity today means that the 'exigencies of immediate need' are a fact of life in a fast-moving network society,

where the time for reflection and caution and due consideration of a problem or issue is, to say the least, dwindling. As Hartmut Rosa argued, the preoccupation of trying to manage with the constantly unexpected, and the myriad issues that one is immediately confronted with, 'resembles premodern forms of existence in which people had to cope with unforeseeable contingencies on a day-to-day basis without being able to plan for the future' (2003: 19–20). The temporal horizon of the future is pulled forward to the present when time is set at a premium and when the past recedes to become a foreign country. Barbara Adam made this point in long-ago 1990: 'when instantaneous reactions are required, the difference between the present and the future is eliminated' (p. 140). Temporally, the present increasingly becomes a constant state of hyper-awareness of the now, of the very recent past and of the very soon to come future. In our networked age, this means not simply being forced to live in and for the moment, it means a *temporal acceleration*. Being connected to networks of information that 'reach out' (MacBride 1967: 4) to us, to colonize our hours with all kinds of distraction, temptation and demand that did not exist for previous analogue generations, is to live a new form of mediated life. The hyper-efficient using up of our time serves, as we are increasingly coming to understand, to accelerate the experience of it (see Rosa 2003: 97–108) and to make us susceptible to time as a postmodern disciplining force in the service of postmodern capitalism.

Nonetheless, it constitutes a signal victory for neoliberal ideology when it is reflected upon that, even within our constrained temporal horizon, technological innovation is still widely seen as positive. However, and this is the important point, this has little or nothing to do with looking towards the future or the building thereof. The technological innovation that touches the lives of most of us today is overwhelmingly digital or digital derived. The innovation that is dreamed up in Silicon Valley and produced in China, such as the smartphone or the tablet computer, as well as all kinds of software and the countless apps that permeate our lives, do not face the future. They do not come to us with a promise or even a suggestion that these products are building a better world for all, a world of progress and happiness and security. They come to us as supposed solutions to supposed problems of the present: that of *connectivity* and (above all) *efficiency*, with both these supposed problems feeding off each other and magnifying each other's importance in our individual lives and in the wider economic reality. To be connected is to be efficient and to be efficient is to be connected. One goes with

the other and both are mandatory if we seek to negotiate the problems and opportunities we confront. Connectivity, or to be 'always on' is something most of us desire to some degree. But it is also something we have no real control over. We need to have access to networks to do our jobs, to study, to have a social life. We are also required to be efficient in our jobs, in our study and even in our social lives. And so 'smarter' computers (we nowadays tend to call something 'smart' as opposed to innovative, which is in itself revealing) are needed to enable us to make the optimal use of time, of information and to respond to the imperatives of the fast pace of change.

There is no end to this circular logic. We can never be connected enough or efficient enough, but there will always be another 'smart' solution to our immediate problems. However, with each new solution comes another problem to be solved. As Neil Postman presciently observed in his *Technopoly: The Surrender of Culture to Technology*:

> Technology increases the available supply of information. As the supply is increased, control mechanisms are strained. Additional control mechanisms are needed to cope with the new information. When additional control mechanisms are themselves technical, they in turn further increase the supply of information.
>
> (1992: 73)

In our network society problems are expressed as problems of information, but when we live and work and struggle to problem-solve in the present, we are unable to step back and reflect and see beyond the tight loop of negative self-reinforcing logic. As individuals, one computer device is almost never enough. Planned obsolescence and mandatory upgrading aside, to be networked means to exist in a state where the quest for technical solutions to informational problems 'block us' as Postman put it, 'from seeing solutions to problems that become visible through a different question' (1992: 126). When there is no conscious expectation of divergent futures, we find ourselves ill-equipped to ask different questions.

We see clearly the same logic functioning at the macro level that shapes and determines our micro-level toil. For example, when the global economy almost slipped over into the chasm in 2007, politicians and policy-makers could have taken time to reflect and think hard about the logic of neoliberal economic crisis. But of course there was no time to spare when market confidence was collapsing – something needed to be done quickly. And so what we institutionally

did was to work within the prevailing logic and reach for whatever was to hand – more of the same, in other words. Consequently in 2008 Viviane Reding, the European Commissioner for Information Society, had no hesitation in telling a high-level meeting of business people what was needed:

> ICTs provide the vital tools to recover from the […] economic slowdown […] the interconnection of trillions of devices at speeds beyond the hundreds of megabits will change the way we communicate and access knowledge and bring radical transformations to production and distribution systems and to services in the private and public sector.
>
> (2008: n.p.n.)

Worse, the 'solution' is seen to be not only information technologies in some abstract technical sense, but also in their institutional form, in their creators and owners such as Google Inc. And so for example, in December 2007 as the scale of the economic crisis was becoming manifest, the British Prime Minister Gordon Brown, not a noted technophile, nonetheless responded in the manner of the network society *zeitgeist* when he publically asked the search engine giant to help tackle the brewing 'development emergency' of the global South (Cockcroft 2007).

A presently unrecognized symptom of the postmodern convergence of technological innovation and network time is a postmodern form of alienation. Over the last few decades a feature of poststructuralist and postmodern theory has been the development of a critique of the thoroughly modernist conception of alienation. This criticized the idea that there exists some deep inner essence that constitutes what it is to be human – something to be alienated *from*. Poststructuralism argued that the idea of the inner self was an Enlightenment myth, derived probably from the religious concept of the soul. Michel Foucault (1997: 282), for example, scorned the notion of a 'human nature or base' that could be alienated – some part of the self that had been closed off by modernity and where capitalism prevented the free expression of this inner being. Marx was centrally implicated in such critique, not least for his early arguments in the *Economic and Philosophical Manuscripts of 1844*, where he stated that under capitalism:

> The *alienation* of the worker in his product means not only that his labour becomes an object, an *external* existence, but that it exists *outside him*, independently, as something alien to him, and that it becomes a power on

> its own confronting him. It means that the life which he has conferred on the object confronts him as something hostile and alien.
>
> (1988: 54)

Such description, coupled with his common use of the term 'species essence', was taken as evidence of outmoded modernist assumptions in Marxism of an essentialism that would deny pluralism and difference. A consequence of the rise to dominance of poststructuralism was that the idea of alienation, along with Marxism, became unfashionable.

To fully consider developments in technology, especially the shift to digitality and automation, a fresh look at the concept of alienation is needed. Indeed, from a philosophical perspective, the revision has begun. We see it in the first major treatise on the subject since the 1970s, Rahel Jaeggi's *Alienation,* which appeared in 2014 and convincingly demolishes the argument that the concept of alienation has to rest upon any form of essentialism. A philosophical problem Jaeggi highlights is that the intellectual eclipse of Marxism (and its component of alienation) served to throw out the modernist baby with its Enlightenment bathwater. The effect was that Marx's key insight of the human alienation from *labour* as opposed to any purported 'essence' went the way of his other arguments. Moreover, the true power of this insight was blunted by the insistence of teleological Marxism, which argued that through socialism, leading to communism, technology would eventually free humans from alienation and then the reintegration process with one's inner essence could begin.

Herbert Marcuse's 1960s critical theory analysis of alienation saw it differently. Capitalism had become so monotonously efficient in his time, he wrote, in *One-Dimensional Man*, that it was able to take alienation to a higher stage, to where the human is almost lost, 'swallowed up by its [own] alienated existence' (1991: 11). 'Total administration' by techno-capitalist life meant that we were simply overwhelmed, and relations between people were occluded by the domination of relationships between things (commodities). A problem for Marcuse was that his ideas dripped pessimism. His phrase 'total administration' encapsulated what was for many of his readers in the 1970s and beyond the salient message and one, like that of climate change today, people are able to readily sublimate or forget. After a burst of fame and influence in the late 1960s, especially in the turbulent streets and campuses of the US, his ideas began to lose their impact. The last edition of his book is dated 1991. And after that both Marx's and Marcuse's ideas on

the concepts of alienation became ideas and concepts that most of us missed in the rising postmodern and neoliberal dawn and the network society created by it.

Nonetheless there is much analytic power in the sublimated idea of our alienation from our labour. The analogue machines that powered the factories that Marx and Marcuse (and many others) critiqued as the generating force that distanced workers from the things that they make are still with us. They have multiplied, indeed, far beyond what pre-1970s theory on alienation could have imagined. They have globalized to incorporate the remnant survivors of the pre-industrial world in the new BRIC economies and many more subsidiary ones besides. These new sites of production are all doubtlessly computer assisted and organized, but in production lines and in factories they retain traces of their analogue heritage, in that workers can still see and touch and smell what they produce; they produce things in workshops and assembly-lines that are material and unfold over time and in space, and so have their analogues still in nature. But even here automation takes its toll and the skills that accrue from analogue work are relentlessly being lost to computer-derived innovation, and workers even more acutely experience the alienation (if they reflect upon it and are not 'swallowed up' as Marcuse put it) that comes from working as machine-appendages.

But human alienation in our digital postmodernity goes deeper again. Analogue globalization today means the thousands of factories of commodity production in the processing zones that stretch from Mexico to Kenya to China. Digital globalization today also means an immense shift to a world dominated by the production of services – an information-intensive based world economy in which even more humans, in terms of raw numbers, now work. The production tasks here can be traditional tasks (such as administration) made more 'efficient' through their computerization, or they can be new tasks created by the demands of the digital economy itself. Either way, they converge into the logic of information processing, be it in the office, in the home, in the store or on the move. Computers are the primary tools and they constitute the means for the networking and navigation of this massive global domain. The idea of the alienation from one's labour still holds, as in the production of commodified material things. However, information workers, workers who work with invisible logic (code and algorithms) that conducts invisible processes (the 'black boxing' of the workings of the tool) are alienated also from the

technology with which they act upon the world and therefore from nature itself. And so to be an information worker is to be doubly alienated: from one's labour and from one's tools. In this context we no longer work and create in an analogue fashion, where the process of work and the product of work correspond with, are proportionate to or are equivalent with, the material environment in some recognizable way. As we saw in Chapter 8, digital processes have no analogue in human action or in nature; we are profoundly distanced from what they do and from what they are, and so computers as tools deny to us the link with our labour and with nature, the connections that constituted the original circle of action.

Terry Eagleton once wrote that 'the final alienation would be to not know we were alienated' (1991: 47). He went on to say, against what he saw as a tendency in the later Marcuse and Adorno, that critique would then become impossible (ibid.). Looking from the perspective of technology and time, as we have here, the double-alienation is in a sense a denouement, or end-point, in that the distancing we experience from labour, technology and nature through digital automation has no further depths to plumb, nothing left to be objectified from. If alienation cannot get any worse, then can its processes still swallow us up? Eagleton thinks not and draws upon Raymond Williams as a source of (theoretical) hope. 'No mode of production', Williams insisted, 'and therefore no dominant social order and therefore no dominant culture ever in reality includes or exhausts all human practice, human energy, and human intention' (Eagleton 1991: 47). The processes of labour and of tool use and of being part of nature are still very much elemental of what it is to be human. Short of becoming automatonic we could never lose all cognitive and emotional contact with these. But to adapt Williams's reasoning, these constitutive forms of being in the world are becoming what he terms 'residual forms of consciousness' (ibid.), forms being worn down through automation and our individual and collective objectification by the process. This takes place in the overarching context of *domination and hegemony* and as Williams wrote in his *Politics and Letters* in 1979 (p. 252):

> However dominant a social system may be, the very meaning of its domination involves a limitation of selection of the activities it covers, so that by definition it cannot exhaust all social experience, which therefore always potentially contains space for alternative acts and alternative intentions which are not yet articulated as a social institution or even project.

The task for politics and for theory is to make 'alternative acts and alternative intentions' possible – and the task here, which we will take up in the next chapter, is to think how it may be possible to make the 'residual forms of consciousness' become emergent.

With her 1918 publication of *The Russian Revolution*, Rosa Luxemburg became one of the earliest critics of Bolshevism and its tactic of the 'seizure of power' whereby a small group of leading individuals took control 'in the name' of the people. In a way it's a tactic similar to Oppenheimer's, in that it is reasoned that if you act quickly and achieve your goal, you can always sort out the problems later. Edmund Burke, in his contemporaneous analysis of the French Revolution, argued that to act now and think later in such a gigantic scale leads only to disaster. Luxemburg makes more or less the same argument. For Luxemburg, the Bolsheviks took power, confident that 'a ready-made formula lies completed in the pocket of the revolutionary party' (2006: 215) and that the people in whose name the revolution was made only had to trust the party to lead them to the future. Luxemburg disagreed and, writing with an unusual perspicacity for a revolutionary of the time, argued that:

> Far from being a sum of ready-made prescriptions that have only to be applied, the practical realization of socialism as an economic, social and juridical system is something that lies completely hidden in the mists of the future. What we possess in our program is nothing but a few main signposts which indicate the general direction in which to look for the necessary measures, and the indications are mainly negative in character at that.
>
> (p. 215)

Luxemburg maintained that the revolutionary process must be more gradual and take 'the whole mass of people' with it. Moreover, this was a superior 'scientific' (p. 215) approach that she imagined followed a scientific logic in that a socialism that is 'hidden in the mists of the future' is a state that only needs to be uncovered and made visible and then made real. The problems of a 'scientific socialism' are today deep and profound, but cannot be dealt with here. However, the more sensible gradualist approach to the future through politics must be addressed as it enables an insight into what are our options for constructing a future of any kind. To begin with the future forging that Luxemburg advocates is today impossible, in striving to create socialism or anything else. It is impossible because it is based upon a future

created by political parties that are today wholly present-centred. Not only that, a plurality of political parties that would challenge the neoliberal hegemony and offer another future simply does not exist in any meaningful way. The neoliberal hegemony, moreover, even if it were able to project it, would not see a divergent future, only a continuation of capitalism in its present form.

A 'better' future, then, however we might like to project it, would also need to be a divergent one, a future that can imagine something else for us to strive for. But how to do this from an unstable and uncertain present, when 'gaining a foothold' is so difficult? This is where we need to make the clear distinction that John Gray makes between science and technology and 'human affairs'. Ideas of progress, innovation and the bright future have, ever since the eighteenth century at least, been bound up in what David Nye termed the 'technological sublime' that 'aims at the future' (1996: 61). This modernist approach has clearly failed and the 'aim' missed its mark. Moreover, technology has shifted from analogue to digital as the dominant mode and there is no longer even a target in the future. Still, modernity gave science and technology a critical capacity, albeit a 'residual' one, and this teaches us that our relationship with nature, however it might be formulated in the future, will need to be sustainable.

Human affairs must now take precedence over science and technology in our approaches towards an ecologically sustainable future. Innovation and temporality must therefore be reframed within a modality that does not promote abstractions of profit and efficiency over human capacities and vulnerabilities. The analogue, in other words, must find its place again in our digital-obsessed and present-oriented postmodernity. This is no small task, but it is one we must undertake. It will require a new way of thinking about technology, about nature and about temporality – all the fundamental realms of human affairs, but which have been skewed by mathematics, by instrumental rationality and by capitalism. By considering the correspondence, or analogue, of two philosophical tenets in the Western tradition, that of *ethics* and a *responsibility* towards the future, then new signposts may become more visible in the mist.

12 Digitality and an ethic of responsibility

> This, in a time of one-sided pressures and mounting risks, is the side of moderation and circumspection, of 'beware!' and 'preserve!'
>
> (Hans Jonas 1985: 204)

The ethical and the digital

When Robert Oppenheimer made his comment about the 'technically sweet' solution taking priority over any reflective or ethical assessment, he was choosing, as we argued in the previous chapter, the fairly common technocratic approach of the scientist to his or her work. By way of some mitigation, however, he was at least *post facto* reflective with respect to his part in the creation of the atomic bomb with his 'I am become Death' quote. Moreover, in 1960, just a few years before his actual death, he replied somewhat enigmatically to a question by a reporter who asked if he had any regrets about his role in the Los Alamos research: 'I do not regret that I had something to do with the technical success of the atomic bomb. It isn't that I don't feel bad, it is that I don't feel worse tonight than I did last night' (Cotkin 2010: 225, n. 151). Such was the immensity of both the technical challenge of nuclear physics and the consequences for humanity that it would have been impossible for anyone with a modicum of human feeling not to have at least had to struggle with the ethical question. Indeed, it could be argued that his *was* an ethical decision, insofar as shortening the war through a working bomb came prior to other considerations. And as his words suggest, the psychological consequences of his ethical choice remained with him. The ethical legacy of those critical 1940s choices are with us today in the still-active Union of Concerned Scientists, a non-profit advocacy group founded in 1968 in the USA and which now has over 200,000 members worldwide. The opening sentence of its Founding Document gives a clear signal of its central ethic concerning the perceived trajectory of the logic of science and technology.

It reads: 'Misuse of scientific and technical knowledge presents a major threat to the existence of mankind' (UCS n.d.).

The scientific and technical knowledge that produced Oppenheimer's atomic bomb and the wider discipline of nuclear physics would have been impossible to attain, of course, without the utility of the then equally experimental discipline of computer science. In the 1940s and 1950s and with deep and close links to the atomic projects in the UK and the USA, key computer scientists such as Alan Turing and John von Neumann worked on the computational challenges that the mathematical language of physics presented. For example, Turing's pioneering work on computation, which we touched on previously, especially his work at the University of Manchester and the working computer he created there, was used with his full cooperation by the British Atomic Weapons Research Establishment for top secret work in the early 1950s (Copeland 2012: 233). Turing's ethical philosophy towards the uses and potential abuses of computing is only sketchily known about. We do know that his ethical approach to his work on machines that may potentially think was strongly inflected by theology. He wrote an essay in 1950 titled 'Computing Machine and Intelligence' and prefaced the main ethical argument by stating, in language opposite to that of Oppenheimer, that we 'should abandon the requirement that every kind of technique should be permitted' (1950: 436). Computers, however, were different in their development, Turing argued, because they were doing God's work. As he goes on to write:

> In attempting to construct such machines we should not be irreverently usurping His power of creating souls, any more than we are in the procreation of children: rather we are, in either case, instruments of His will providing mansions for the souls that He creates.
>
> (1950: 433)

Turing could see that digital computers would be universal enablers and by using this power (a God-given one, he suggests), then we would be doing God's good work. In this Turing was not so different from the early capitalists of the eighteenth century who were also riding the wave of immense transformation but, as Max Weber had argued, were able to convince themselves and much of society that they were doing it to the glory of God, as well as for profit. Turing's is doubtlessly an ethical approach, but it is a weak one, as it assumes the ethical dimension of computing is somehow sacred and embedded in the process of the development of the technology itself and not something that

humans need constantly to reflect upon and constantly insert into all processes of technological change.

John von Neumann was a member of a circle of *mitteleuropa émigrés* who were central figures in the development of computer science. He was another influential mid twentieth-century scientist who placed his trust in mathematical logic and therefore computing as being repositories of some deep truth. Moreover, von Neumann was instrumental in the development of Game Theory, where computers are used to model conflict and interaction between 'intelligent rational decision-makers', which meant human beings and economies (Myerson 1991: 1). A contemporary and collaborator of von Neumann's in Game Theory was Karl Menger, who published a book in 1934 that argued that mathematical logic could model *ethical behaviour* in a way that was superior to human reasoning because its logic would not 'be influenced by subjective feelings' (Menger 1974: 1).

The view that mathematical logic and computing have an ethical dimension or ethical logic, which humans could learn from or adapt to, has a powerful legacy that is still prevalent today. In his 2012 book *Turing's Cathedral: The Origins of the Digital Universe*, George Dyson narrates a history of a small group of people, Turing and von Neumann among them, who, through their work in the Institute for Advanced Study in Princeton during the 1940s and 1950s, transformed how computer theory and computer ethics evolved in practice. Dyson traces this history to our own time, to where Turing's 'cathedral' his 'mansions for the souls' and a version of Menger's ethics had migrated to the Google headquarters in California. Dyson interviewed a Google engineer who explained that humans 'would all eventually have implanted auxiliary memories, individually initialized with everything we need to know. Knowledge would become universal, and evil could be edited out' (2012: 313). Dyson went on to note that Google's own 'cathedral' was the expression of the vision of Hannes Alfvén, whose 1966 sci-fi book, *The Tale of the Big Computer: A Vision,* saw a new world emerging from computer science. Alfvén wrote that: 'Computers are designed to be problem solvers […] If we have the choice of being governed by problem generating troublemakers, or by problem solvers, every sensible man […] would prefer the latter' (cited in Dyson 2012: 303). That computers were in themselves 'good' and even 'ethical' was implicit in Alfvén's prophecy. At Google's California campus, its engineers, its entrepreneurs and its owners had unreflectively internalized this vision as part of the 'magic' of the digital. Dyson again quotes Alfvén whose

artificial intelligence (AI) vision had in fact been 'brought to life' in the people and the ethos and the ethical worldview of those at Google who create the digital processes that constitute the interface for the vast majority of us who access the global network. Google's philosophy, beyond 'don't be evil', has a certain perspective on what it is to be human:

> The primary biological function of the brain was that of a weapon. It is still not quite clear in which brain circuits the lust for power is created. In any case data machines seem devoid of any such circuits, and it is this which gives them their moral superiority over man; it is for this reason that computers were able to establish the kind of society which man had striven for and so abysmally failed to achieve.
>
> (cited in Dyson 2012: 313)

Alfvén's *Tale* doesn't make clear how an absence – that which is 'devoid' in machines – can provide the basis for a moral centre. Yet it is this absence of *philosophical rigour* that characterizes most ethical considerations of computer processes today. As with Oppenheimer, consciously or unconsciously, the 'technically sweet' attraction predominates in the leading tech corporations – or at the very least computing's purported dazzling potential provides the basis for what is a half-baked ethical dimension.

Not so for Norbert Wiener, who merits recognition as a much more *bona fide* philosopher and ethicist of computer science, but one whose vision, as we will see, was snuffed out by the human 'lust for power' that Alfvén thought would be 'solved' by computing. Wiener was the founder of what is today called 'computer ethics' or 'information ethics'. Sadly this sub-discipline of computer theory, when not concerning itself to the much narrower questions of computer crime and computer privacy, is largely quiescent and ineffectual in respect of the larger and more philosophical questions and issues that Wiener himself was among the first to grapple with. The bulk of Wiener's ethical thinking is contained in his book *The Human use of Human Beings*, which was first published in 1950. Wiener was a mathematician and computer scientist who was as optimistic as any of the leading theoreticians in the field at the time in respect of the potential for computing. However, and this is more than suggested in the title of his book, he was concerned that humans should direct the process at all times. His field was cybernetics, the quintessence of automation, and for Wiener the coming 'automatic age' had to

be approached cautiously and reflectively and, ultimately, ethically. 'What [should] we do and how should we react to the new world that confronts us' (1954: 12) were questions that had to be addressed in tandem with technical progress. He goes on to argue that 'Our worship of progress may be discussed from two points of view: a factual one and an ethical one' (p. 41). The key element of progress in cybernetics was automaticity, a process with a profound and factual consequence not only for the displaced worker in a factory or office, but also for society more broadly, especially through the potential of AI that was just beginning to be theorized by Wiener and others. This all amounted to a *kind* of progress, but it is the kind that we can too easily be fatalistic (or excited) about – 'the price of progress' and so forth – and therefore the kind that we as a society pay little critical and ethical attention to.

Wiener did pay attention to the ethics of automaticity, to effects that go beyond worker displacement. He writes that:

> Let us remember that the automatic machine […] is the economic equivalent of slave labor. Any labor which competes with slave labor must accept the economic conditions of slave labor. It is perfectly clear that this will produce an unemployment situation, in comparison with which the present recession and even the depression of the thirties will seem a pleasant joke. Thus the new industrial revolution is a two-edged sword. It may be used for the benefit of humanity. […] It may also be used to destroy humanity, and if it is not used intelligently it can go very far in that direction.
>
> (1954: 162)

Humans and machines were two radically different spheres according to Wiener, with the former continually needing to exert ethical control over the latter. But cybernetics was already being used in ways, such as through military application, that as we shall see worked against any kind of ethical input from humans, indeed in ways that increasingly made conscious and reflective human interaction – and thus ethical intervention – impossible. Cybernetics, in Wiener's conception, was about machines responding to data from the external world, such as in his classic example of the 'photoelectric automatic door' (1954: 23). This was very different in *principle and in practice* from the highly complex 'command, control and communication' logic that the US military began to employ in its strategic nuclear missile systems in the 1950s. The first example was/is based upon simple human interaction with

a machine sensor. The human agent initiates (or not) the automatic process of human *control* in a closed loop of feedback. The second is oriented towards taking humans (and potential human error) out of the loop, a loop that is essentially a de-subjectified Gehlenian 'circle of action'. And so, in increasingly complex systems, systems respond to input from other connected automatic systems with pre-programmed reactions. The whole edifice becomes anti-human – and anti-analogue – as Wiener himself noted, because it is digitally encoded to 'fight nature's tendency to destroy the organized' (1954: 17). Increasingly high levels of complexity therefore necessitate more automation, and more automation (as we saw in the previous chapter through Neil Postman) demands more complex systems to keep automation from becoming 'disorganized' through the inevitability of thermodynamic entropy in the natural world (1954: 40).

It was this application of cybernetics towards less human control and more complex automation that caused Wiener to worry about this particular one-sided logic of 'progress', or the 'technically sweet' outcome. Wiener was acutely aware of the ethical dangers that computer automation meant in the hands of the military. In the appendix to his book he publishes a letter he wrote to the US military in response to a request from them for scientific papers concerning his work on 'command, control and communication'. In particular, they were seeking advice on how to perfect a 'controlled missile' project. His ethical stance dictated that he tell them that he would not assist them in any way, even to provide copies of published work that was out of print. He further responded with a back-handed critique of the ethical laxity of computer scientists and mathematicians who had worked on the atomic bomb:

> The experience of the scientists who have worked on the atomic bomb has indicated that in any investigation of this kind the scientist ends by putting powers in the hands of the people whom he is least inclined to trust with their use.
>
> (1954: xxvii)

The 'controlled missile' project was at the time the embodiment of what 1950s cybernetics could make possible – a payload that would aim, travel and hit its target with the minimum of human intervention. Wiener saw that automation in no way abrogated human responsibility from the inevitably of unpredictable consequences. For him, such automatic technique 'represents the still imperfect supplement to the

atom bomb […]' that would only 'kill foreign civilians indiscriminately' (ibid.). In time the computerized 'supplement' would grow and complexify and *network* to become the core technology and not only for the atomic bomb, but for the daily lives of billions of people.

The digital is not ethical

Wiener's ethical stance and the prospects for an ethical science and technology more broadly, dissipated in the context of 1950s' Cold War *realpolitik*. In the West, and in the US in particular, what President Eisenhower in his 1961 farewell speech termed the 'military-industrial complex' had fundamentally changed the face of scientific R&D. From his unique standpoint he saw that:

> free ideas and scientific discovery, [had] experienced a revolution in the conduct of research. Partly because of the huge costs involved, a government contract becomes virtually a substitute for intellectual curiosity. For every old blackboard there are now hundreds of new electronic computers.
>
> (Public Papers of the Presidents)

Clearly, by 1961, the logic of computing *had already* colonized the leading edge of science and technological development in the United States.

President Eisenhower fretted that 'The total influence—economic, political, even spiritual' of the military-industrial complex may work to the detriment of the 'freedoms' the West enjoyed (Public Papers of the Presidents). But widespread public outrage against purported dark forces in big business and big government was never going to be an issue. The class that C. Wright Mills called the 'power elite' was then well able to manipulate public opinion to the extent that Eisenhower's fears were never perceived as a usurpation of a scientific 'good' by a military 'evil' (Mills 1956: 316–17). The sphere where computer science actually clashed with ethics was never a public one. Within this netherworld of Cold War military-industrial research a self-legitimizing 'discourse' evolved over the 1960s and 1970s that served to construct the ethical dimension of bombs and computers in a positive way in the context of the 'free world' struggle against communist totalitarianism (Edwards 1995). As Paul N. Edwards argues, the internalization of the ethic of Alan Turing in particular created a discourse where it was understood that his 'cathedrals' were being built by good men and

women in the military-industrial complex, where nuclear war was being averted through staying ahead of the Soviet competition by means of ever more complex and destructive nuclear weapons systems.

Crucially for Edwards the Foucauldian framed 'discourse' inside this 'closed world' adopted the Turing/AI metaphor of computers as models for the human mind to create a '*cyborg discourse*, by constructing human minds and artificial intelligences and information machines [that] helped to integrate people into complex technological systems' (1995: 2, emphasis in original). Over these vital decades of technological advances in computing, the development of 'closed systems' took place within a 'closed world' that developed and internalized its own 'closed discourse' regarding what computers represented and what they could practically achieve – which was a very great deal. In its turn, this world created the technological and ideological basis for what would become the internet. The cautious and ethical approach of Wiener, who insisted that human beings must be in charge of human beings, was forgotten as the metaphors of AI such as 'thinking is computation' and 'the mind is an information machine' (Edwards 1995: 161) were internalized, generalized and a whole new world created. As computer science and technology migrated from the military lab to the university and commercial lab, the metaphors had become precepts and the logics of computer-driven speed and automaticity through complex digital systems were almost universally accepted as forms of progress in the office, in the home and as gargantuan networked systems that billions of people would eventually inhabit.

Edwards's book has a chapter titled: 'Why build computers?'. His own answers concern power – its creation within an elite and its use in the service of 'national priorities' (p. 73) in the context of a particularly US-centric perception of the national interest. This is undoubtedly true. But it says nothing, really, about why we have computing in our world and why it has become so completely dominant and dominating today. Edwards's thesis might explain why Wiener's ethical concerns were ignored, but it cannot tell us why the ethical cannot flourish within the digital. It cannot because, as we have seen throughout much of this book, computing has been developed and oriented towards automation and temporal acceleration from the very beginning and these logics excise the human component radically. What this means is that there can be no ethical dimension without a *human, reflective and analogue-temporal dimension*. Without this the digital and the ethical are fundamentally antithetical.

As we have seen, from the time of Leibniz's development of the theory of binary numbers in the seventeenth century, the human body and brain were perceived as an obstacle to mathematical efficiency. Leibniz sought to eliminate human error from human communication through a programmable language that would become universal. The usefulness inherent in such a concept could have become a human good, a positive (if ultimately quixotic) development in early computing logic. However, at a key point in Western history Leibnizian ideas were developed and applied along an instrumental trajectory, towards efficiency and acceleration in the context of industrialization. Early nineteenth-century natural philosophers such as John Herschel and Charles Babbage developed what Ashworth (1996) terms a 'calculating eye' for business methods, and businesses were quick to see the attraction of more precise and faster production processes they envisaged.

Jumping forwards to the capitalism of the 1970s we see that the model of efficiency in analogue machine production that Herschel and Babbage had helped mathematize had become a worn-out Victorian model (Lash & Urry 1987). It was in this era of crisis that capitalism and its productive processes found a new lease of life, not only through the rising ideology of neoliberalism, but also in a practical way through the new capacities offered by computer automation. The internet evolved to become the cornerstone of economy, culture and society across the planet. It created the time–space compression that David Harvey (1989: 242) recognized as a historically revolutionary force, but taken to levels undreamed of in the late 1980s. Harvey recognized also that the 'speed up' of life through technological processes was having an effect upon 'the gap between scientific and moral reasoning' (p. 327). Harvey wrote prior to the emergence of a commercial internet but could observe even then that the digital and automated economy of 'flexible-accumulation' would leave ethical considerations of any kind lagging very much behind the imperatives of profits.

Today moral reasoning, or the ethical aspect, is hardly counted when industries, institutions and individuals are being transformed though exposure to the logic of networked computing. We are expected to adapt to such transformation or risk being swept aside. In the 1980s Margaret Thatcher was famous for continually repeating the mantra that 'there is no alternative' to the economic and technological change that she herself spearheaded as chief ideologue. By telling people there was no choice, what she was arguing was that we must give ourselves over to the impersonal forces of markets and microchips. However,

by doing so we have allowed ourselves to be colonized by the twin-logics of automation and acceleration. We now live in a 24/7 existence where, as Jonathan Crary observes, the 'rhythms, speeds and formats of accelerated and intensified consumption [and, we add, production] are reshaping experience and perception' (2014: 39). The space and time needed for humans to consider the ethical dimensions not only of their own life, but also that of the global society of which we are now a part, diminishes with every new app that reaches out to entertain or 'enhance' us; with every new upgrade that will fix the bugs in our increasingly complex computers; and with every new device that will keep us looking at a computer screen in a way that can only devalue the irreducible face-to-face encounter that shapes human conduct and has formed the basis of our understanding of ethical theory and practice from our earliest times as a social animal (Levinas 1985).

Towards a shared ethic for a networked world

An ethic is a mode of human conduct. It is also a feeling and an attitude, sometimes specific and sometimes not derived from or directed to the people and the world that surrounds us. An ethic is a desire to treat individuals in a certain way; it constitutes a certain attitude towards society whereupon the resultant ethical conduct has its effects upon the social, cultural, economic and political environment, which in turn can reshape the ethical attitude of the individual. It is a dialectical process in other words. This reads as a tranquil, and perhaps tranquilizing, articulation of what might be called 'the ethical dimension'. However, such a description of the ethical process makes sense only in the context of an analogue world, a world that has been diminishing with the seemingly unstoppable rise of digitality. Today our networked existence affords neither the time that computers relentlessly colonize, nor the involvement with the analogue world that automation systematically detaches us from, to give sustaining foundation to a practical ethics based upon such a dialectical process.

What we understand of ethical thinking and conduct were conceived and framed in an analogue world. As we argued in a previous chapter, those living in a pre-digital world had nothing to contrast their analogue world with: it just *was* and so we never really considered it. We now have that contrast. If we are reflective and critical enough, we can see that digitality – the culture of computing in the service of efficiency and automation – cannot develop, much less sustain, an ethical dimension. This is a troubling realization, but recognition of this ethical

vacuum is the best place from which to move forward. Recognition and acceptance of the fact that we are analogue creatures in a digital world means that we are able reconsider what in fact constitutes an ethic in its original analogical form, and then begin to think about what stops it from functioning in the digital context. From here it becomes possible to consider how such obstacles may be overcome. However, our conclusions are necessarily sketchy. So with that in mind what follows is first and foremost the opening of a new conversation, one to be held by us in future research – and we hope by others, at other times and in other spaces.

A concern with temporality and how our relationship with it has been transformed over the past generation gives us a way to think about how the context for ethical conduct has changed. Once again we look to a German philosopher who takes technology as a central element of his enquiry. In 1979 Hans Jonas wrote a remarkable book titled *The Imperative of Responsibility: In Search of an Ethics for the Technological Age*. His book was published in German in 1979 and appeared in a single English translation in 1985. In it Jonas fuses bioethics with politics and temporality to give what is a superlative philosophical diagnosis of the effects of neoliberal globalization and the revolution in information and communication technologies. It has been our contention that the analogue human has been displaced in respect of the capacity to act upon the world and its processes, by the double-abstraction of digitality in the service of neoliberal capitalism. Jonas's book is precursory in that he argues that we have become 'entrapped' by our technological success to the point where the 'realm of making has invaded the space of individual essential action'. He goes on to insist that 'morality must invade the realm of making' (Jonas 1985: 9). However, our current moral and ethical thought-systems, Jonas acknowledges, are not up to the new technological challenges that confront us. Coercive technology and accelerated temporality, he suggests, are the key disabling factors. Foreshadowing the effects of network computing and time–space compression, Jonas observes that 'the short arm of human power' has become massively extended and has radically altered the nature of human action (p. 6). This extension of human action through networked computing colonizes time and space but does not bring adequate human control and human reason with it. Such extensions, to borrow again from McLuhan, are also 'auto-amputations' (1964: Ch. 4). That is to say, the logic of digital automaticity functions *apart* from the individual or collective circle of

action to create its own path of development instrumentally directed towards acceleration and 'efficiency'. Humans are compelled through economic necessity to follow and 'adapt'.

In his consideration of what the fading power of human action means, Jonas continues: 'Modern technology has introduced actions of such novel scale, objects and consequences that the framework of former ethics can no longer contain them' (1985: 6). Jonas's primary concern is to develop a set of ethical principles that would protect nature (the ecosphere within which humans must live) and render it sustainable and liveable into the future. Traditional ethics cannot deliver on these requirements for two main reasons. First is that all ethical principles in Western philosophy have heretofore been *anthropocentric* – that is, concerned only with human conduct towards other humans. Second is that the temporal nature of such ethical conduct has been present-centred, where: 'proper [ethical] conduct had its immediate criteria and almost immediate consummation. The long run of consequences beyond was left to chance, fate or providence' (pp. 4–5). In short, ethical principles have in the past concerned only us humans, and we have been little interested in the future consequences of our actions. From this Jonas develops his central theme, which is the construction of an ethic of responsibility that extends beyond the individual *towards nature* – and *towards the future* that 'modern technology' is colonizing and degrading through its increasing autonomy.

Jonas's conception and elaboration of an ethic of responsibility is an intellectual breakthrough that deserves much more credit and attention than it has had. Times have changed, but the need for an ethic of responsibility is more acute than ever. The threat to the environment has worsened and our relationship with anything beyond the short-term future horizon is weakening. Jonas could not foresee the grip that digitality would exert over humanity in such a short space of time. This is a minor problem for his thesis as it relates to our transformed technological circumstance today and one we must clear up. The creation of an ethic of responsibility is still the vital task, but we need to change the focus of responsibility from 'technology' as broadly conceived by Jonas, to *digitality* in particular.

The first thing to note is that the tyranny of increased automation and social acceleration leaves us ill-equipped to think sufficiently (ethically or otherwise) about nature as a global project demanding urgent attention. Our disastrous collective record on fighting the causes of climate change is testimony to how to produce 'ineffectual' and 'non-

binding' commitments to the most serious challenge we face as a species (O'Connor 2014). The same tyranny stops us individually and collectively from being future-oriented. Short-termism in capitalism and the speeding up of life for those who work within it makes for a future that is difficult to envisage even vaguely, much less have a connection with – or responsibility for. So we must focus on the obstacle to the development of an ethic of responsibility, which is neoliberalized and globalized networked computing. We must shift the focus from the confines of an anthropocentric ethic to the analysis of the conduct of the digital usurper that creates the vacuum within which *no* ethic is able to properly function. And we must conceive and implement forms of individual, collective, corporate and institutional responsibility over out-of-control computer systems that keep us running like the hamster on the wheel. These would be the first steps in developing a new relationship with nature and with the future within which an ethic of responsibility might take hold.

This is fundamentally a political question. But as we have seen, we live in a mono-political world where institutional politics are weak, indecisive and unable to carry out any major changes in the human condition that work against the imperatives of profit making. How then to develop an ethical politics of responsibility towards our digital culture? Indeed what are we supposed to be responsible *for* in a fractured world, peopled by disconnected and often cynical individuals? A possible answer lies in Jonas's starkly simple philosophical move. He argues for a focus on the 'archetype of all responsibility' and the ancient origin of 'every disposition of it' (1985: 101), which is that of *parental responsibility* – the feeling and attitude of the mother, father, guardian for their child or dependent. This is responsibility towards the child in the present but it also factors for the continued safety and well-being of the child into futures that unfold generationally. The idea of the child in nature, vulnerable and helpless, is an emotionally compelling force. However, it is also a force that becomes increasingly abstract beyond one's immediate family or kin and through lived time. For Jonas, the way to limit this diminishment of feeling of parental responsibility beyond the immediate sphere is to interpenetrate it with a *political responsibility*, so as to give intellectual and institutional durability to it. A problem might be that the attitude and feeling of responsibility, both parental and political, are 'total' in their singularity and can easily become totalitarian. However, for Jonas, if these spheres (the individual and the state) are allowed to function dialectically, especially in the sphere of

education, where people are able to see the needs of others in their own, then interests can overlap and complement each other and avoid extremes of either parent or state responsibility (p. 103). Crucially, if environmental sustainability into the future is the guiding objective for the attainment of human well-being, then political responsibility needs parental responsibility – and *vice versa*.

Given that responsibility for environmental sustainability (and therefore the context for the well-being of the child) is practically impossible in our networked postmodernity, we must therefore focus upon that which obstructs our path to the construction of an ethic of responsibility. The digitality that grows and accelerates beyond the control of any human responsibility stops us being properly responsible for our children and for the sustainable environment that they need to live in. Unless we acknowledge this central issue, then responsibility or ethics will continue to mean little. Renewed responsibility towards our technological environment can only be meaningful if we assert *analogue control over digital logic*. The human use of human beings must mean that the integrity of our analogue limitations is of primary concern when conceiving and implementing the immense potentials and capacities of networked computing. This is to assume responsibility over processes and things that have become abstract. But responsibility for computer logic and its effects doesn't feel anything like responsibility for our children and for their environment. How can we feel ourselves responsible for abstractions? Well, there is a powerful example of such abstract collective responsibility that shows we have the capacity for adopting it.

When Richard von Weizsäcker died in 2015 aged in his nineties, we were reminded of our power for the creation of an individual, collective and political ethic of responsibility. Weizsäcker fought in the Wehrmacht and was wounded on the Eastern Front during the Second World War. He is best remembered, however, as President of West Germany from 1984 to 1990. In May 1985 he gave a celebrated speech to mark the fortieth anniversary of the end of the war. In it he used the term 'responsibility' nine times to denote the necessary collective German attitude to what occurred during the Nazi years. The question, he argued, was not about 'guilt or innocence' but about remembrance and acknowledgement, especially of the treatment of the Jews of occupied Europe. The acceptance of an ethic of responsibility, he noted, had been gradual. Indeed '40 years were required for a complete transfer of responsibility from the generation of the fathers'. The shouldering of the burden

of responsibility had not been smooth and the 1960s and 1970s were politically turbulent in West Germany. However, Germans slowly began to accept responsibility for their past and they also accepted responsibility for the future. They did this through laws and a constitution that were sufficiently stringent to ensure that a racist and militarist culture did not again have fertile ground in which to flourish. Moreover, Jonas's stipulation of the collaboration between parent and state, especially through the West German education system where the school curriculum taught the facts of the German instigation of the Second World War and its consequences, eventually had its generational effects.

Ethical responsibility must be applied to the sphere of digitality where there is an ethical vacuum. However, a personal ethical responsibility is not enough. The digital logic that constitutes a barrier to sustainability, and sustainability itself, are global problems that we can barely comprehend, much less solve, as isolated individuals. We need both to come together as a global community and scale up the challenge that we need to face. The ethicist Peter Singer makes a related appeal for a global collective to have a necessary predominance over the limited and narrowed and prejudiced tendencies of the individual. In his *One World: The Ethics of Globalization* he writes that:

> If the group to which we must justify ourselves is the tribe, or the nation, then our morality is likely to be tribal, or nationalistic. If, however, the revolution in communications has created a global audience, then we might need to justify our behaviour to the whole world. This change creates the material basis for a new ethic that will serve the interests of all those who live on this planet in a way that, despite much rhetoric, no previous ethic has done.
>
> (2004: 12)

Singer takes the ethic of responsibility to the global level in order to meet the specific challenges that neoliberal globalization and the computer revolution confronts state power and legitimacy with. Moreover, by specifying the necessary 'material basis' for a global ethic of responsibility, Singer implies that digital communication is merely the means to an end (a new ethic) and that the process itself is fundamentally an analogue one involving people who are in control of the means of communication.

The search for an ethic of responsibility, however, requires yet another step beyond connection at the global level if we are to humanize digital technology and globalize our attitude towards nature. Carol C. Gould

provides such a step in her essay 'Transnational Solidarities' (2007). In it she takes Emile Durkheim's concept of *solidarity* and adapts it to our globalized present to try to answer the question: 'How can people possibly feel […] solidarity with everyone else?' (2007: 149). Concentrating on Durkheim's notion of 'organic solidarity' Gould writes that:

> people are linked in interdependent relations with others through an extended division of labour. Here their ties to each other occur almost behind their backs, especially proceeding via their economic interrelations, in which they function as differentiated parts of a large organism. (p. 150)

The globalization and digitization of the means of production, she argues, has rendered Durkheim's *mediation* of solidarity through the division of labour as problematic. Gould argues for a reconceptualization of organic solidarity through what she terms the 'affective element' where transnational solidarities can 'be motivated by affective ties of care and concern' (p. 156). In other words, Gould attempts a rearticulation of the older ethical dimensions of *empathy* or 'sympathy' that philosophers such as David Hume and Adam Smith explored. Gould identifies examples of concrete 'manifestations of solidaristic relations in transnational contexts' in the Indian Ocean tsunami of 2004 and in the devastation of Hurricane Katrina in the US in 2005. Gould views these as examples of 'transnational common projects' that create a shared 'moral disposition' (pp. 157–8).

Gould's thesis has resonance at a certain level, but it is not a form of solidarity or 'moral disposition' that is sufficiently underpinned by an empathy to lead to a global ethic. Responses to the events in the islands of the Indian Ocean and in New Orleans were doubtlessly empathetic in that the millions who watched scenes of devastation on television could imaginatively engage in what the drowning and stranded victims were feeling. But this is at best a *transient and mediatized empathy*. Feeling is created through media and soon submerges into our consciousness through the media cycle. The ethical solidarity that Gould calls for must have its heart in the deeper and elemental processes of nature – the very processes that digitality abstracts us from. It is significant that Gould's examples of global solidarity come from nature, because nature is the key. It is only nature, or natural catastrophes, that can bring us together in a fundamental sense – to make us powerfully cognizant of our own vulnerability through an immediate empathy with nature's 'victims'. This has the capacity to stimulate an

instantly felt ethic of responsibility for our children in what appears as a random and capricious natural world that we and they and everyone else must live in. Sloughing off the obstacle of digitality would open the way to the *truly organic*. It would make possible a world solidarity that would be – through our implication with the environment, and through the care and concern for the present and future safety of those whom we love – *a proximate, yet globally connected ethic of responsibility*.

A new mediation for the production of a global organic-ethical solidarity and the ties that they can create need not take place mysteriously 'behind our backs' as Gould puts it. We have the means at our fingertips, literally, in the devices that connect us. However, our lack of control over the logic, application and effect of network computing makes recognition of this fact difficult. There is a well-known environmental slogan that goes, 'think locally, act globally'. We need to complement and augment this statement to fit with the networked realities of globalization: we need to *think analogically and act digitally*. To think as analogue beings, to be cognizant of the threat of the digital and to place the logic of the digital in the service of people instead of instrumental 'efficiency' would be the first step.

Can a new ethic evolve from a new attitude towards digitality? Yes it can. Indeed, as Jonas tells us, such a goal is 'modest' when set against the 'immodesty' and arrogance of the Enlightenment-derived technological utopia that drives economy and society today. Such modesty would not mean faint-heartedness, but a rejection of the unearned promise of technology. Jonas continues:

> Not timidity, but the imperative of responsibility issues the novel call to modesty. Utopia at any rate, insofar as harnessed to material plenty – *the* immodest goal par excellence – must be renounced; not only because, if ever attained, could not last, but more so because already the road in that direction leads to disaster.
>
> (1985: 191)

A global and networked ethic *is* possible. We also have little choice in the matter. We have that deepest of all responsibilities – to our children – compelling us to try. The nature and function of computing in our lives constitutes the ethical imperative in our postmodern age. Confronting digitality is possible only when we recognize that our analogue essence has its real home only in nature. Such a realization would be to create the philosophical basis for the identification and reconnection with our relationship to nature and the circle of action

that Arnold Gehlen argued to be so fundamental. The irreducibly analogue character of humans would become salient for this first time, enabling us to relate to the digital and its ideology of 'efficiency' in new and more empowering and human ways. Efficiency could be oriented towards the needs of people and the environment instead of productivity and profit. And it would allow us eventually to realize Norbert Wiener's dream of the human use of human beings, through an ethic of responsibility not only to each other as members of the same species, but to nature and its systems and to its uncountable other species.

Conclusion

Bridging the past and future

We often think of philosophy as an especially abstract, rarefied modality of research, cut off from the everyday needs and concerns of its practitioners. To a large extent, this is indeed accurate. It was of course Plato – 'the first to install mathematics as a model of method', argues Adorno (1973: 43) – who encouraged his students to embrace the surety of arithmetical thought as a way of transcending the crude distortions of empirical experience, and this movement of transcendence has found itself replicated time and time again over the broader history of Western philosophical discourse. In one sense, being deliberately provocative, we might argue that it is in philosophy itself – perhaps beginning with the mathematically focused mysticism of the Pythagoreans – that we first find a fully formed *digital mentality*, one that strives to locate a realm of symbolically encoded knowledge that bears no concrete resemblance to any physical (and thus analogue) phenomena.

Philosophy has always had (and always will have) digital currents running through it, for that is in some vague way the nature of language itself: to divide, to discretize and to homogenize. Going back to the very beginnings of the Greek tradition we see basic dualisms forming, dividing the world into discrete segments so that it may be analysed and (hopefully) understood, however imperfectly. This is the very basis of critical thought in all of its complexity and ambiguity. Yet it is also in the legacy of this digitality and, in particular, in the desire to use such digitality to transcend the messy contingencies and seeming paradoxes of the material world, encapsulated so perfectly by Leibniz's quest for a universal language articulable through formal logic and mathematics, that we witness the first glimpses of what today has become both the technical and the ideological grounding of the digitally networked society.

Across Part II of this book we have identified a historical process of digitization that manifests itself in ubiquitous computation and which

effectively severs any direct link between technics and human thought, the former increasingly operating at speeds simply incomprehensible to the latter. This is a digitality that, in other words, has been stripped not only of its analogues with the natural world (i.e. of our external environment or milieu, the world in which we inhabit and with which we are continuously implicated), but also its analogues with our usual modalities of thought, which tend to function by combining the empirical and the ideal, like Thales measuring the height of pyramids. Ironically, and even paradoxically, this hegemonic (and thoroughly ideological) equation of truth and quantification leaves the place of humanity itself in a fraught position. On the one hand, it solidifies an image of the world as essentially enumerable and thus manipulable and exploitable by human means; on the other hand, this enumeration and the way that it manifests through sophisticated and complex processes of computation, requires a technical infrastructure that effectively writes human thought out of the picture. Digitization would seem, at least in its ideal form, to inevitably obsolesce humanity.

Yet as we attempted to illustrate in Part I, even if this logic only really found its efficacious technical support in the forms of electromechanical and then electronic computing first developed during the Second World War, its roots lie in an occidental discourse of rationalist and mechanistic philosophy that we can trace back to the Greeks. 'Scientific objectification,' writes Adorno (1973: 43), 'in line with the quantifying tendency of all science since Descartes, tends to eliminate qualities and to transform them into measurable definitions'. It is in this objectification, whereby the heterogeneous phenomena of the world are converted into quantifiable values, that digitization in its most primitive form begins. The problem then is not so much quantification and measurement themselves (which form at least part of the basis of critical thought), but their outright externalization, which, while operating on centuries old desire to, as Bacon (2000: 100) puts it, 'renew and extend the power and empire of the human race itself over the universe of things' (a statement which powerfully presages the rampant exploitation of natural resources that would occur during the industrial revolution), represents a distinct moment in human history insofar as the calculative potentialities of our nervous system have effectively been exteriorized.

This is what Stiegler (2009: 97) describes as the 'mastery of information through the conquest of speed', the problem being of course that such mastery is always both delusive and elusive. There is no end

to history in such a conception, as there is for Hegel or Marx; instead, there is always more information to be processed and utilized, and accordingly always more computing power needed to achieve such ends. The *teleology* of our age – the end-point to which we orient ourselves in our everyday practices – is not the absolute knowledge sought by the ancients, the messianic eschatology of the Abrahamic religions, or the peaceful utopia of the scientists and philosophers of the Enlightenment (Sutherland 2014). In fact, what we seem to have is less an end-goal than a *horizon*, always receding, never reachable. In the words of Virilio (2008: 86), this is a violence 'where movement is everything and the end without value […] success is nothing, all that counts is the pursuit', to the extent to which we're often no longer really sure exactly why we are actually pursuing it (efficiency, productivity and so on) in the first place.

To understand better the way this shift has occurred, and its relationship to the subjects that we have covered in this book, we can look towards Horkheimer's distinction between *objective*, *subjective* and *instrumental* reason. Prior to the Age of Enlightenment, he argues, philosophy was characterized by an adamant belief in 'the existence of reason as a force not only in the individual mind but also in the objective world—in relations among human beings and between social classes, in social institutions, and in nature and its manifestations' (Horkheimer 1974: 4). Philosophers sought to categorize the world on the basis of its essential *reasonableness*, understanding themselves as existing within a hierarchy that encompassed all beings. The purpose of philosophy was thus primarily to elucidate these rational and universal structures that underpinned the universe, focusing 'on the idea of the greatest good, on the problem of human destiny, and on the way of realization of ultimate goals' (Horkheimer 1974: 4), presuming that one's goal was to live one's life in accordance with these structures. Reason, to put it simply, was always perceived as more than something confined to human thought, supporting and binding the universe in its heterogeneity – hence why Plato, for instance, views all truth as united in its emergence from the form of Good. Objective reason focuses upon ends rather than means.

This objective theory of reason is clearly evidenced in the work of the ancient philosophers whom we have discussed, but it carries through that also of the mediaeval scholastics (who view all reason as derived, in sum, from the infinite knowledge and goodness of God) and perhaps as far as the transcendental idealism of Kant, who we already know

proposed that all knowledge of the world is dependent upon universal categories of thought. Prior to Kant, however, in the rise of British empiricism (beginning especially with Locke), Horkheimer (1974: 4) perceives another form of reason becoming more prominent – one in which 'reason is a subjective faculty of the mind' rather than an inherent principle of reality itself. This subjective reason, he posits, denies the metaphysical universality of these rational structures and instead locates them within the human subject. The result is that the notion of any ultimate end to thought – an ontological absolute towards which our inquiries may be directed – is sworn off and in its place is a single-minded concern with *means* rather than ends. 'Ultimately subjective reason proves to be the ability to calculate probabilities and thereby to co-ordinate the right means with a given end' (Horkheimer 1974: 4).

Of course, Horkheimer isn't suggesting that subjective reason only emerged in the sixteenth century, for philosophy has always had a subjective component and has always considered means as well as ends (much of Plato's project, for instance, is a study of the means for living a life in accordance with the Good). As Eric Havelock (1963: 197) observes in relation to the change in the concept of the *psyche* that had emerged by the time of Plato:

> instead of signifying a man's ghost or wraith, or a man's breath or his life blood, a thing devoid of sense and self-consciousness, it came to mean 'the ghost that thinks', that is capable both of moral decision and of scientific cognition, and is the seat of moral responsibility, something infinitely precious, an essence unique in the whole realm of nature.

On the contrary then, rather than the sudden appearance of subjective reason, what occurs during the Enlightenment is the gradual liquidation of the objective side of this equation, such that any consideration of these ends is gradually abandoned. The question of what can be considered *reasonable* is reduced to that of purpose rather than an essential quality. No longer can anything be considered *inherently* reasonable; rather, things are judged on the extent to which they fulfil a given purpose. Self-interest and the celebration of the sovereign individual gradually take precedence over the concrete principles that are supposed to found the democratic state.

The end result of this subjectivization, suggests Horkheimer (1974: 15), is an eventual instrumentalization of reason, whereby it becomes 'completely harnessed to the social process', the sole criterion for reasonableness being '[i]ts operational values, its role in the domination of

men and nature'. Such instrumentalism, in which conceptual thought is reduced to a mere form of classification designed to streamline intellectual labour, is the product of a contradiction between subjective reason on the one hand and the political dogma of self-interest and egoism on the other; the latter effectively absolutizes the former and, in doing so, reifies this radical subjectivity in the form of an unquestioning objective reason. 'The more ideas have become automatic, instrumentalized,' writes Horkheimer (1974: 15), 'the less does anybody see in them thoughts with a meaning of their own. They are considered things, machines. Language has been reduced to just another tool in the gigantic apparatus of production in modern society.'

This critique is largely directed towards two schools of early twentieth-century philosophical thought – logic positivism and pragmatism – that he perceives as exemplary of this instrumentalized spirit, subordinating truth to practical ends. In more general terms, though, although neither of these schools of thought are particularly prominent today, this distinction between objective, subjective and instrumental reason is still a useful way of thinking about our current circumstances. As we have shown again and again in Part II of this book, the digital logic that not only drives technical development today, but exercises an inescapable influence over almost every aspect of our lives, has little interest in the kinds of values – truth, goodness, justice, piety, courage, beauty, wisdom and so on – that motivated the ancient, mediaeval and even some early modern philosophers in their enquiries. Instead, thought has become a procedure, grounded in quantitative classification and calculation, and propelled by the demand for efficiency ('time is money') to the extent that, from the seventeenth century onwards (when Pascal first invented his adding machine in order to assist his father's work as a tax commissioner), we can come to rely more and more upon machines that perform these procedures without the need for much human intervention. Thought itself would seem to have been removed from the picture.

This is not to suggest that we should be pining nostalgically for the age of classical philosophy. Objective reason is founded upon an overt essentialism that assumes each object and person to have both an essential character and virtue, thus establishing rigid and often hugely discriminatory hierarchies. For example, it has long been recognized that Plato's idealism uncomfortably replicates the authoritarian, aristocratic and grossly misogynistic social structure in which it was produced, even while it attempts to establish its distance from such

worldly concerns. 'The Platonic prejudice that the imperishable must be the good' is, contends Adorno (1973: 131), little more than an absolutization of the notion that 'in permanent warfare the stronger is always right', unjustifiably valorizing endurance over other qualities. The irony, he goes on to note, is that it was Plato 'who gave to entity, to that which is, the name of "that which is not"', and yet at the same time 'wrote a doctrine of the state in which the eternal ideas are akin to such empirical definitions as the exchange of equivalents and the division of labour' (Adorno 1973: 137, translation altered). As much as Plato claimed to despise the decadence and corruption of Athenian society, his ontology draws upon many of its most ingrained values and then reifies them in the hierarchical structure of the forms – precisely those objects that are supposed to transcend such structures.

It is easy to get caught up in an uncritical nostalgia for the past, failing to reflect upon the enormous inadequacies that prior modalities of thought bring with them. At the same time, though, it is equally problematic to remain in thrall to the present, to accept this as the 'best of all possible worlds' (to borrow a phrase from Leibniz) without seeking to understand why we have reached this position and what other potentialities from the past remain unactualized. Philosophy, as a history of ideas, has an interesting relationship to the history of technological development. As we saw in Chapter 1, Plato, in perhaps the first clear instance of media theory, was highly suspicious of the role that writing – the key emergent technology of his time – played in Greek education and looked back with a certain romanticism to an age prior to its invention, when students' memories were not corrupted by these alien marks upon which they now relied. And yet the scientific register in which Plato operates – 'the demand that the Greek language and the Greek mind break with the poetic inheritance, the rhythmically memorised flow of imagery, and substitute the syntax of scientific discourse' (Havelock 1963: 182) – would seem to be directly congruent with and resultant of the structural and discursive possibilities opened by this medium.

Plato is not alone in this, for many philosophers from antiquity through to the present day have been sceptical of the effects wrought by new media technologies, but simultaneously seem to adopt or internalize many of the characteristics of these media within their approaches. Philosophy is often fearful of media, insofar as the latter challenge the presumed ideality (and autonomy) of thought upon which philosophy has so typically been founded, and yet such media have also driven

philosophical conceptuality (and *vice versa*). The unsettling thing about media, when viewed from the perspective of philosophical discursivity, is that they persistently threaten to reveal the material and technical supports that effectively prop up philosophical thought and have done so since the time of Thales (who may not have written down any of his own philosophy, but nonetheless drew upon modes of calculative reason with a distinctly material basis). This is the trouble that we face when studying media, as we flagged in the introduction – media are everywhere and they affect us in ways that are typically anything but obvious. And it's a problem that is especially troubling today, given both the variety and ubiquity of media forms, both digital and analogue, with which we interact constantly.

In fact, it would not at all be unreasonable to observe that our concerns regarding digitization in the networked society bear some striking similarities to the complaints that Plato makes in relation to writing; in both cases, what we see is an anxiety regarding the *exteriorization* of thought and the way in which this separates the processing of information from the critical faculties of human reason and experience. These are not concerns that are at all specific to our present age. And yet, in drawing these parallels, perhaps we are more effectively able to note both the similarities in the circumstances we face, and also the sharp differences. Media studies so often concerns itself with *medium specificity*, and it is in this specificity – the distinct attributes, functions and effects – that we must place our focus when examining the long history of media technologies. In order to avoid falling into either a hyperbolic 'technophilia (the rhetoric of enabling technology) or technophobia (the ideologies of technological determinism)' (Thacker 2004: 6), we need to carefully take stock of our own media environment both in its irreducible singularity and in relation to those that have come before. Media, as McLuhan emphasizes (1964), cannot be reduced to any particular positive or negative effects upon the human mind or sensorium, for they contain within them the potential to both extend and amputate.

In concluding this book we have looked chiefly at two roles of philosophy as a component of this history: first, as a form of rationalization and categorization that has, at least in some aspects, prefigured the digitization and ubiquitous computerization of the networked society; and second, as a means of critiquing such a society, albeit one that we must acknowledge is inherently and inextricably tied up in its object of critique (insofar as philosophy is always in need of communication

and thus always mediated). Yet there is a third important role also, and one that we examined in detail in Chapter 12: philosophy as an ethics of resistance to a given state of affairs, an imagination of new possible worlds and a retrieval of those potentialities that have been left behind, those aleatory moments abandoned in the movement of history – to 'brush history against the grain', in the words of Walter Benjamin (1968: 248).

Karl Marx's famed eleventh thesis on Ludwig Feuerbach (a nineteenth-century German materialist philosopher) succinctly expresses his frustration with philosophy up to that point – philosophers had only sought to interpret the world, forgoing their responsibility to actually *change* it. This is a not uncommon narrative surrounding philosophical discourse, alleging that it is too conservative, too eager to deal with abstractions and idealities rather than the political, social and technical exigencies of the world within which they reside. And yet, as we have seen throughout this book, philosophy is always tied to its historical circumstances, and from its earliest days philosophers have concerned themselves with the problems of both ethics (how one should conduct oneself and live one's life) and politics (how the *polis* – that is, literally, the city – should be organized and governed). Heraclitus saw it as necessary to exile himself from the city-state so that he could devote himself to the divine law of the *logos* rather than its corrupted simulacrum that men used to rule. Socrates was condemned and eventually executed by the citizenry of Athens for wielding too great an influence over its youth – hence Plato's desire to reform the city-state under the aegis of philosophical doctrine. Aristotle asked explicitly both how one could live a good life and how a city-state could best be run, understanding these two questions as being united in a broader philosophy of human affairs and concerns.

In our present time – an age of instrumentalized reason, characterized by an ideologically ossified nexus between a radically individualized ideology of self-interest and an automatized, digitized networking infrastructure that operates without either concern for human values (what the technocrats would call 'quality of life') or care for the finite and fragile resources of our planet – philosophy would seem to be more important than ever, not only because it provides a means for critique of these circumstances, but also because in its very practice – careful, considered and contemplative – it provides an important alternative to the uncritical pragmatism and calculative logic that we have discussed throughout. Life in the networked society is fraught

and mired in uncertainty, and while there is no obvious panacea for this twenty-first century malaise, we believe that it is this suture of neoliberal egotism to the inhuman temporalities of the information and communication technology revolution that must first be pulled apart. In order to do this, a specific time of *human thought* needs to be regained, and perhaps nothing exemplifies such a modality more effectively than the conjuncture of philosophy and history, neither of which can ever be reduced to computational processes.

'In the globalized information cultures so often described in terms of speeding up and temporalities surpassing those of our human perceptional possibilities', observes Jussi Parikka (2012: 3), 'a fascination also with the past seems to be emerging.' Yet this fascination needs to be more than mere nostalgia – wistful longing for a prior golden age. There are no golden ages. Rather, as we have already noted, it should be about retrieving the forgotten potentialities of the past. As McLuhan (1967: 166) argues:

> You can never perceive the impact of any new technology directly; but it can be done in the manner of Perseus looking at the Gorgon in the mirror of art. You have to perceive the consequences of the new environment on the old environment before you know what the new environment is. You cannot tell what it is until you have seen it do things to the old one. The need, however, to understand the processes and changes brought about by the new technology gets stronger as the technology does.

The past is inherently entangled in the future. Thus, perhaps, we need to look backwards if we wish to escape the (increasingly ineludible) present. The connection between media and philosophy, both historical and contemporary, is far too broad a subject to cover comprehensively within a single book, if ever. What we have attempted instead is to trace a contingent path through this history, from ancient Greece through to the digital age; from a time when philosophers conceived of the world in terms of the natural elements, to one overwhelmingly dominated by an instrumentalized, calculative, technically mediated form of knowledge. In this way, we hope that we can make some contribution to a greater understanding of the dynamics and hazards of our media environment today.

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